DEPARTMENT OF FISCAL SERVICES

PURCHASING DIVISION

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

September 21, 2005

To: PROSPECTIVE PROPOSERS AND ALL OTHERS CONCERNED

From: Diane Reed, Sr. Contracts Analyst

Subject: RFP-0013-05/DRR – Hydrogeological Services for Solid Waste Management Division

Due Date: September 28, 2005 @ 2:00 PM

ADDENDUM #2

Total pages: 1

The information included in this Addendum revises, clarifies, or supplements the specifications and other provisions of the contract documents and is considered part and parcel to the RFP Package.

The attached data was requested by Randy Sherman from Shaw Mechanical.

Failure to acknowledge receipt of this addendum on the submittal shall result in disqualification of your bid response.

Signature on File

Diane Reed
Sr Contracts Analyst

EXHIBIT I

OSCEOLA ROAD SOLID WASTE MANAGEMENT FACILITY

WACS FACILITY ID: 26122

MONITORING PLAN IMPLEMENTATION SCHEDULE

GENERAL

1. The permittee must initiate implementation of this Monitoring Plan within sixty (60) days from the date of permit issuance.

2. The field testing, sample collection and preservation and laboratory testing, including quality control procedures, shall be in accordance with **Chapter 62-160 Florida Administrative Code (F.A.C.).** Approved methods as published by the Department or as published in Standard Methods, ASTM, or EPA Methods shall be used.

3. The organization collecting samples at this site must use the Field and Laboratory Standard Operating Procedures (DEP-SOP-001/01 and DEP SOP-002/01) in Chapter 62-160, F.A.C. Sampling personnel must have a copy of the SOP for purging and sampling in the field when sampling and must be knowledgeable of its contents, procedures, and forms. The laboratory designated to conduct the chemical analyses must be certified by the Florida Department of Health Environmental Laboratory Certification Program (DoH ELCP). This Certification must be for the test method and analyte(s) that are reported.

4. If, at any time, analyses show that ground water standards or minimum criteria are exceeded in the detection wells or at the edge of the Zone of Discharge, the Permittee shall resample the wells within thirty (30) days after the sampling data are received, to confirm the data. Should the permittee choose not to resample, the Department will consider the water quality analysis as representative of current ground water conditions at the facility. If the data are confirmed, or if the permittee chooses not to resample, the permittee shall notify the Department in writing within 14 days of this finding. Upon notification by the Department, the permittee shall initiate evaluation monitoring in accordance with Rule 62-701.510(7) F.A.C.

5. The Department must be notified in writing at least fourteen (14) days prior to the installation and/or sampling of any monitoring well(s).

GROUND WATER QUALITY MONITORING

6. The thirty-six (36) ground water monitoring wells designated for water quality testing are listed on Attachment A and are shown on Attachment B. The wells and piezometers for water level measurements are shown on Attachment B.

NOTE: Unless otherwise approved by the Department, wells with high turbidities must be remediated or reinstalled to reduce the turbidity value to less than 20 NTU's prior to sample collection. Should any ground water sample exhibit dissolved

oxygen concentrations greater than 20% of oxygen saturation at the field measured temperature, the sampled well must be repurged then resampled as soon as an acceptable dissolved oxygen value has been attained unless it can be demonstrated that insitu ground water contains higher levels of dissolved oxygen. All water quality analyses will be performed on unfiltered samples unless approved by the Department.

7. The initial samples collected from MW-21S and MW-21I shall be analyzed as follows: temperature (field), dissolved oxygen (field), pH (field), specific conductance (field), turbidity (field), total ammonia as N, chlorides, nitrate, total dissolved solids, iron, mercury, sodium, and the EPA 40 CFR, Part 258, Appendix I and Appendix II parameters. **All analyses must use detection limits at or below state standards and/or minimum criteria for ground water quality** unless dilution of the sample is necessary due to high contaminant concentrations or the Method Detection Limit using the most sensitive and currently available technology is higher than a specific criterion, in which case the practical quantitation limit must be used.

8. Samples from the thirty-six (36) ground water monitoring wells shall be collected semi-annually and analyzed as follows: temperature (field), dissolved oxygen (field), pH (field), specific conductance (field), turbidity (field), total ammonia as N, chlorides, nitrate, total dissolved solids, iron, mercury, sodium, and the EPA 40 CFR, Part 258, Appendix I parameters. **All analyses must use detection limits at or below state standards and/or minimum criteria for ground water quality** unless dilution of the sample is necessary due to high contaminant concentrations or the Method Detection Limit using the most sensitive and currently available technology is higher than a specific criterion, in which case the practical quantitation limit must be used.

9. Ground water levels in all wells, whether sampled or not, and all piezometers must be measured to the nearest 0.01 foot and reported semiannually unless required more frequently by permit condition. All water level measurements must be made within a one day period. These measurements must be referenced to the National Geodetic Vertical Datum of 1929 (NGVD).

SURFACE WATER MONITORING

10. The two (2) surface water sites included in this monitoring plan are SW-8 and SS-5. They are listed on Attachment A and shown on Attachment B.

11. Samples from the two (2) surface water monitoring sites shall be collected semi-annually and analyzed as follows: temperature (field), dissolved oxygen (field), pH (field), specific conductance (field), turbidity (field), unionized ammonia (NH3), total hardness as CaCO3, total organic carbon, total dissolved solids, total suspended solids, biochemical oxygen demand (5 day), chemical oxygen demand, total nitrogen as N, nitrate as N, total phosphates as P, chlorophyll A, iron, mercury, and the EPA 40 CFR, Part 258, Appendix I parameters. All analyses must use detection limits at or below state standards and/or minimum criteria unless dilution of the sample is necessary due to high contaminant concentrations or the Method Detection Limit using the most

sensitive and currently available technology is higher than a specific criterion, in which case the practical quantitation limit must be used.

12. Surface water elevations at sampling locations SW-8 and SS-5 must be measured to the nearest 0.01 foot on the same day as ground water levels in the wells and piezometers and reported semiannually unless required more frequently by permit condition. All water level measurements must be made within a one day period. These measurements must be referenced to NGVD.

LEACHATE QUALITY MONITORING

13. The site designated for leachate quality testing is L-1. The site is listed on Attachment A and shown on Attachment B.

14. Samples from the leachate monitoring sites shall be collected annually and analyzed for dissolved oxygen (field), pH (field), specific conductance (field) total ammonia as N, bicarbonate, chlorides, nitrate, total dissolved solids, iron, mercury, sodium and the EPA 40 CFR, Part 258, Appendix II parameters. **All analyses must use detection limits at or below 40 CFR Part 261.24 standards.**

MONITORING WELL REQUIREMENTS

15. New monitoring wells MW-21S and MW-21I shall be installed within sixty (60) days from the date of permit issuance.

16. If a monitoring well becomes damaged or inoperable, the Permittee shall notify the Department in writing within seven (7) days. The written report shall describe what problem has occurred and the remedial measures that have been taken to prevent a recurrence. The Department can require the replacement of inoperable monitoring wells.

17. New or replacement monitoring well design or placement must be approved by the Department. Proposed well construction details based on site specific borings must be submitted with all supporting data (grain size distribution analyses, in-situ hydraulic conductivity testing, depth to water, etc.) for Department approval prior to well installation. Use of hollow stem auger equipment is recommended. Other drilling methods must be approved by the Department prior to well installation.

18. All wells shall be clearly and permanently labeled and the well site maintained so that the well is visible at all times. Protective barriers must be installed at all wells which may be subject to damage by heavy equipment or traffic.

19. An abandonment plan for abandoning any well which is unsuitable for ground water monitoring must be approved by the Department prior to abandonment.

REPORTING REQUIREMENTS

GENERAL

20. Well completion reports for new monitoring well(s) MW-21S and MW-21I must be submitted to the Department on the attached Ground Water Monitoring Well Completion Report Form thirty (30) days after installation. Note that the top of casing elevation of each well, to an accuracy of 0.01 feet, and the latitude and longitude of each well in degrees, minutes and seconds, to two (2) decimal places, with an accuracy of 15 feet, must be determined and certified by a Florida Registered Surveyor and provided on the form. In addition, as-built well construction diagrams and soil boring logs that cover the entire depth of the monitoring well(s) must be submitted to the Department.

21. A drawing must be submitted within sixty (60) days following monitoring well installation showing the location of all monitoring wells (active and abandoned), water bodies and waste filled areas. The location of features on the drawing must be horizontally and vertically located by standard surveying techniques. The drawing shall include all monitoring well locations, each monitoring well name and identification (WACS) number, the top of casing, pad elevation, permanent benchmark(s) and/or corner monument marker(s) referenced to NGVD with an accuracy of 0.01 feet. The survey shall be conducted and certified by a Florida Registered Surveyor.

22. A total depth measurement must be made on all wells at time of permit renewal. This measurement is to be reported as total apparent depth below ground surface and should be compared to the original total depth of the well.

SEMI-ANNUALLY

23. The required monitoring results must be submitted to the Department within thirty (30) days of receipt from the laboratory. These data shall be accompanied by a Ground Water Monitoring Report form (FDEP Form 62-522.900(2). A copy of this form is attached. The monitoring reports shall include all the parameters described above.

There are two options for reporting monitoring results.

1. Paper Reporting: Parameter Report Forms FDEP Forms 62-522.900(2) are attached for reporting semi-annual analyses. In order to facilitate entry of this data into the State computer system, these forms or exact replicas must be used and must not be altered as to content. The original copies of the forms should be retained so that the necessary information is available to properly complete future reports.

2. Electronic Reporting: The monitoring data may be submitted electronically on floppy diskettes or compact disc media readable by a Microsoft Windows computer. The Department may use electronic-tools (e.g. Validator) to conduct data quality review and compliance checking. Electronic laboratory data must be submitted in a specific format called a tab-delimited text file with the first line of the file being the data field names. (Note: Microsoft Excel produces this file format when the "Save As" and "Text

(Tab Delimited)" options are selected.) The following data fields must be present in the data:

- Analytical Method
- Date of Analysis
- Date of Preparation (if applicable)
- Date of Sampling
- Detection Limit of the Analysis
- DOH Certification Number of the Laboratory
- Matrix (Aqueous, Drinking Water, Saline/Estuarine, or Solids)
- Analytical Result
- Appropriate Data Qualifiers (as listed in Florida Administrative Code 62-160)
- Analytical Result Units
- WACS Testsite ID
- Parameter Name (Name of the Compound Analyzed for/Test Performed)
- STORET Parameter Code (as provided by the Department's Bureau of Solid and Hazardous Waste; must be six digits: e.g. 039430 for Isodrin)

All dates are to be submitted in MM/DD/YYYY HH:MI:SS format (e.g. 05/14/1973 17:18:00 for May 14, 1973, 5:18:00 p.m.). A sample of an acceptable data format will be posted to the Bureau of Laboratories web site,
http://www.floridadep.org/labs/software

The submittal shall also include laboratory reports, Chain of Custody sheets, field data sheets, Water Sampling Logs (attached), ground water contour maps, a summary of any water quality standards or minimum criteria that are exceeded and any other required documents. These reports may be submitted electronically in portable document format (PDF) in lieu of a paper copy. If a specific document has a requirement to be signed and sealed, an original signed and sealed paper copy must also be submitted unless it is specifically permitted by law or rule to be signed electronically.

Please note that the Department of Environmental Protection's (DEP's) new Standard Operating Procedures for Field Activities, DEP-SOP-001/01, January 01, 2002, become effective on April 9, 2002. The revised protocols, including those for ground water sampling (FS2200), can be accesses at the DEP's internet address
http://www.dep.state.fl.us/labs/qa/sops.htm

24. Water levels in all monitoring wells, whether sampled or not, all piezometers and all surface water sites must be measured to the nearest 0.01 foot and reported semi-annually unless required more frequently by permit condition. All water level measurements must be made within a one day period. These measurements should be reported in a table that includes well or surface water point name, date water level measured, measuring point elevation referenced to NGVD, depth to water and calculated water level elevation referenced to NGVD.

25. A ground water elevation contour map for each monitored aquifer zone must be submitted semi-annually to the Department. Ground water elevation contour map(s) should include monitoring well and piezometer locations, ground water elevation at each monitoring well location referenced to NGVD, a bar scale, ground water contour interval, date of measurement and ground water flow direction. The map(s) must incorporate adjacent and on-site surface water elevations where appropriate. These maps shall be signed and sealed pursuant to Florida Statutes (F.S.) Chapters 471 and 492 which require that documents requiring the practice of professional engineering or professional geology, as described in Chapter 471 or 492, F.S., be signed and sealed by the professional(s) who prepared or approved them. This certification must be made by a registered professional who is able to demonstrate competence in this subject area.

BIENNIALLY

26. A technical report shall be submitted to the Department every two years, and shall be updated at the time of permit renewal. The report shall summarize and interpret the water quality data and water level measurements collected during the past four years. The report shall contain, at a minimum, the following:

a. Tabular and graphical displays of any data which shows that a monitoring parameter has been detected, including hydrographs for all monitoring wells.
b. Trend analyses of any monitoring parameters detected.
c. Comparisons among shallow, middle, and deep zone wells.
d. Comparison between upgradient and downgradient wells.
e. Correlation between related parameters such as total dissolved solids and specific conductance.
f. Discussion of erratic and/or poorly correlated data.
g. An interpretation of the ground water contour maps, including an evaluation of ground water flow rates.
h. An evaluation of the adequacy of the water quality monitoring frequency and sampling locations based upon site conditions.

This report must be signed and sealed pursuant to Florida Statutes (F.S.) Chapters 471 and 492 which require that documents requiring the practice of professional engineering or professional geology, as described in Chapter 471 or 492, F.S., be signed and sealed by the professional(s) who prepared or approved them. This certification must be made by a registered professional who is able to demonstrate competence in the subject area(s) addressed within the sealed document.

EXHIBIT I

SANLANDO SOFTBALL COMPLEX CLOSED LANDFILL

WACS #: 83417

MONITORING PLAN IMPLEMENTATION SCHEDULE

GENERAL

1. The responsible party must initiate implementation of this Monitoring Plan within sixty (60) days from the date of issuance.

2. The field testing, sample collection and preservation and laboratory testing, including quality control procedures, shall be in accordance with **Chapter 62-160 Florida Administrative Code (F.A.C.)**. Approved methods as published by the Department or as published in Standard Methods, ASTM, or EPA Methods shall be used.

3. The organization collecting samples at this site must use the Field and Laboratory Standard Operating Procedures (DEP-SOP-001/01 and DEP SOP-002/01) in Chapter 62-160, F.A.C. Sampling personnel must have a copy of the SOP for purging and sampling in the field when sampling and must be knowledgeable of its contents, procedures, and forms. The laboratory designated to conduct the chemical analyses must be certified by the Florida Department of Health Environmental Laboratory Certification Program (DoH ELCP). This Certification must be for the test method and analyte(s) that are reported.

4. If, at any time, analyses detect parameters which are significantly above background water quality, or which are at levels above the Department's water quality standards or criteria specified in Chapter 62-520, F.A.C., in the detection wells or at the edge of the Zone of Discharge, the Permittee shall resample the wells within thirty (30) days after the sampling data are received, to confirm the data. Should the permittee choose not to resample, the Department will consider the water quality analysis as representative of current ground water conditions at the facility. If the data are confirmed, or if the permittee chooses not to resample, the permittee shall notify the Department in writing within 14 days of this finding. Upon notification by the Department, the permittee shall initiate evaluation monitoring in accordance with Rule 62-701.510(7) F.A.C.

5. The Department must be notified in writing at least fourteen (14) days prior to the installation and/or sampling of any monitoring well(s).

GROUND WATER QUALITY MONITORING

6. The seven (7) ground water monitoring wells designated for water quality testing and for water level measurements are listed on Attachment A and are shown on Attachment B.

and reported semiannually unless required more frequently by permit condition. All water level measurements must be made within a one day period. These measurements must be referenced to NGVD.

MONITORING WELL REQUIREMENTS

12. If a monitoring well becomes damaged or inoperable, the Permittee shall notify the Department in writing within seven (7) days. The written report shall describe what problem has occurred and the remedial measures that have been taken to prevent a recurrence. The Department can require the replacement of inoperable monitoring wells.

13. New or replacement monitoring well design or placement must be approved by the Department. Proposed well construction details based on site specific borings must be submitted with all supporting data (grain size distribution analyses, in-situ hydraulic conductivity testing, depth to water, etc.) for Department approval prior to well installation. Use of hollow stem auger equipment is recommended. Other drilling methods must be approved by the Department prior to well installation.

14. All wells shall be clearly and permanently labeled and the well site maintained so that the well is visible at all times. Protective barriers must be installed at all wells which may be subject to damage by heavy equipment or traffic.

15. An abandonment plan for abandoning any well which is unsuitable for ground water monitoring must be approved by the Department prior to abandonment.

REPORTING REQUIREMENTS

GENERAL

16. Well completion reports for new monitoring wells must be submitted to the Department on the attached Ground Water Monitoring Well Completion Report Form thirty (30) days after installation. Note that the top of casing elevation of each well, to an accuracy of 0.01 feet, and the latitude and longitude of each well in degrees, minutes and seconds, to two (2) decimal places, with an accuracy of 15 feet, must be determined and certified by a Florida Registered Surveyor and provided on the form. In addition, as-built well construction diagrams and soil boring logs that cover the entire depth of the monitoring well(s) must be submitted to the Department.

17. A drawing must be submitted within sixty (60) days following monitoring well installation showing the location of all monitoring wells (active and abandoned), water bodies and waste filled areas. The location of features on the drawing must be horizontally and vertically located by standard surveying techniques. The drawing shall include all monitoring well locations, each monitoring well name and identification (WACS) number, the top of casing, pad elevation, permanent benchmark(s) and/or corner monument marker(s) referenced to NGVD with an accuracy of 0.01 feet. The survey shall be conducted and certified by a Florida Registered Surveyor.

be posted to the Bureau of Laboratories web site, http://www.floridadep.org/labs/software/.

The submittal shall also include laboratory reports, Chain of Custody sheets, field data sheets, Water Sampling Logs (attached), ground water contour maps, a summary of any water quality standards or minimum criteria that are exceeded and any other required documents. These reports may be submitted electronically in portable document format (PDF) in lieu of a paper copy. If a specific document has a requirement to be signed and sealed, an original signed and sealed paper copy must also be submitted unless it is specifically permitted by law or rule to be signed electronically.

Please note that the Department of Environmental Protection's (DEP's) new *Standard Operating Procedures for Field Activities, DEP-SOP-001/01, January 01, 2002,* become effective on April 9, 2002. The revised protocols, including those for ground water sampling (FS2200), can be accessed at the DEP's internet address; http://www.dep.state.fl.us/labs/qa/sops.htm.

20. Water levels in all monitoring wells, whether sampled or not, and all surface water sites must be measured to the nearest 0.01 foot and reported semi-annually unless required more frequently by permit condition. All water level measurements must be made within a one day period. These measurements should be reported in a table that includes well or surface water point name, date water level measured, measuring point elevation referenced to NGVD, depth to water and calculated water level elevation referenced to NGVD.

21. A ground water elevation contour map for each monitored aquifer zone must be submitted semi-annually to the Department. Ground water elevation contour map(s) should include monitoring well and piezometer locations, ground water elevation at each monitoring well location referenced to NGVD, a bar scale, ground water contour interval, date of measurement and ground water flow direction. The map(s) must incorporate adjacent and on-site surface water elevations where appropriate. These maps shall be signed and sealed pursuant to Florida Statutes (F.S.) Chapters 471 and 492 which require that documents requiring the practice of professional engineering or professional geology, as described in Chapter 471 or 492, F.S., be signed and sealed by the professional(s) who prepared or approved them. This certification must be made by a registered professional who is able to demonstrate competence in this subject area.

BIENNIALLY

22. A technical report shall be submitted to the Department every two years, and shall be updated at the time of permit renewal. The report shall summarize and interpret the water quality data and water level measurements collected during the past four years. The report shall contain, at a minimum, the following:

ATTACHMENT A

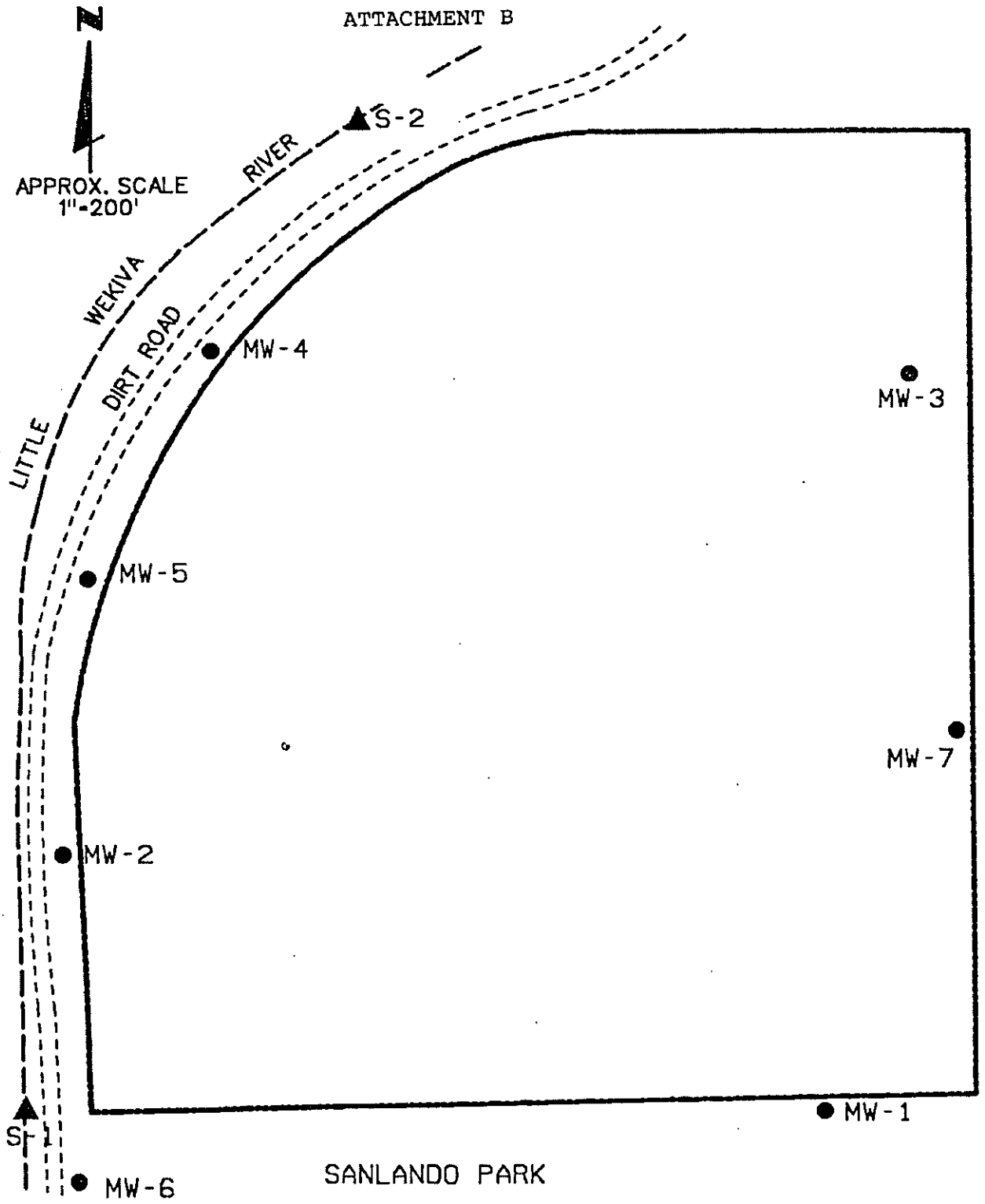
SANLANDO SOFTBALL COMPLEX (CLOSED LANDFILL)
WACS FACILITY: 83417
MONITORING SITES

MONITORING_ SITE_NUM	WACS_WELL	WELL_ TYPE	ZONE/LOCATION MONITORED
GROUND WATER			
MW-1	18711	BG	UPPER SURFICIAL
MW-2R	18712	CO	UPPER SURFICIAL
MW-3R	18713	CO	UPPER SURFICIAL
MW-4R	18714	CO	UPPER SURFICIAL
MW-5R	18715	CO	UPPER SURFICIAL
MW-6	18716	BG	UPPER SURFICIAL
MW-7	18717	CO	UPPER SURFICIAL
SURFACE WATER			
SW-1	18718	CO	SURFACE WATER
SW-2	18719	CO	SURFACE WATER

Well Type Codes

(AS) Assessment	(BG) Background	(CO) Compliance	(DE) Detection
(DG) Downgradient	(IM) Intermediate	(IW) Irrigation Well	(OT) Other
(PZ) Piezometer	(SO) Source	(UP) Upgradient	(WS) Water supply

ATTACHMENT B



PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

SANLANDO SOFTBALL COMPLEX SITE MAP

FIGURE 1-1

DGN:$$$$$$$$$$$$$$$$$$$$$$$$$$$$SPECIFICATION$$$$$$$$$$$$$$$$$$$$$$$$$$$$

$$$$$$SYTIME$$$$$$ --- EMP. NO: EMPLOYEE_NUMBER

SANLANDO SOFTBALL COMPLEX (CLOSED LANDFILL)

PARAMETER MONITORING REPORT
(Rule 62-701.510)
WACS Report Type: SEMDS
Semi-Annual Ground Water Monitoring (Page 1 of 3)

WACS_FACILITY 83417 SAMPLE DATE _____

WACS_WELL _____ ANALYSIS DATE _____

MONITORING_SITE_NUM _____ PERMITTED: ___ WELL TYPE

(AS) Assessment (IW) Irrigation Well
(BG) Background (OT) Other
(CO) Compliance (PZ) Piezometer
(DE) Detection (SO) Source
(DG) Downgradient (UP) Upgradient
(IM) Intermediate (WS) Water supply

Ground water classification: G-II

Well Purged prior to Sample Collection? (Y/N) _____

STORET CODE	PARAMETER MONITORED	SAMPLING METHOD	FIELD FILTERED	PERSERVATIVES ADDED	ANALYSIS METHOD	ANALYSIS RESULT	UNITS	DETECTION LIMITS/ UNITS
082545	Water Level						Ft	
000010	Temperature (field)						°C	
000299	Dissolved Oxygen (field)						Mg/L	
000406	pH (field)						STD	
000094	Spec. Conductance (field)						Umhos/cm	
082078	Turbidity (field)						NTU's	
000610	Total Ammonia as N						Mg/L	
000940	Chlorides						Mg/L	
000620	Nitrate as N						Mg/L	
070300	Total Dissolved Solids						Mg/L	
	METALS							
001002	Arsenic						Ug/L	
001027	Cadmium						Ug/L	
001034	Chromium						Ug/L	
001045	Iron						Ug/L	
001051	Lead						Ug/L	
071900	Mercury						Ug/l	
000929	Sodium						Mg/L	
	EPA METHOD 601							
032101	Bromodichloromethane						Ug/L	
032104	Bromoform						Ug/L	
032102	Carbon Tetrachloride						Ug/L	
034301	Chlorobenzene						Ug/L	
034311	Chloroethane						Ug/L	

SANLANDO SOFTBALL COMPLEX (CLOSED LANDFILL)

PARAMETER MONITORING REPORT
(Rule 62-701.510)
WACS Report Type: SEMDS
Semi-Annual Ground Water Monitoring (Page 3 of 3)

WACS_FACILITY 83417 SAMPLE DATE _____

WACS_WELL _____ ANALYSIS DATE _____

MONITORING_SITE_NUM _____

Ground water classification: G-II

Well Purged prior to Sample Collection? (Y/N) _____

PERMITTED: ___ WELL TYPE
(AS) Assessment (IW) Irrigation Well
(BG) Background (OT) Other
(CO) Compliance (PZ) Piezometer
(DE) Detection (SO) Source
(DG) Downgradient (UP) Upgradient
(IM) Intermediate (WS) Water supply

STORET CODE	PARAMETER MONITORED	SAMPLING METHOD	FIELD FILTERED	PERSERVATIVES ADDED	ANALYSIS METHOD	ANALYSIS RESULT	UNITS	DETECTION LIMITS/ UNITS
	EPA METHOD 602							
034030	Benzene						Ug/L	
034371	Ethylbenzene						Ug/L	
034010	Toluene						Ug/L	
034020	Xylenes						Ug/L	

SANLANDO SOFTBALL COMPLEX (CLOSED LANDFILL)

PARAMETER MONITORING REPORT
(Rule 62-701.510)
WACS Report Type: DSSSW
Surface Water Monitoring (Page 1 of 3)

WACS_FACILITY _____ SAMPLE DATE _____

WACS_WELL _____ ANALYSIS DATE _____

MONITORING_SITE_NUM _____ Surface water classification: SW-IIIF

STORET CODE	PARAMETER MONITORED	SAMPLING METHOD	FIELD FILTERED	PRESERVATIVES ADDED	ANALYSIS METHOD	ANALYSIS RESULT	UNITS	DETECTION LIMITS/ UNITS
082545	Water Level						Ft	
000010	Temperature (field)						°C	
000299	Dissolved Oxygen (field)						Mg/L	
000406	pH (field)						STD	
000094	Spec. Conductance (field)						Umhos/cm	
082078	Turbidity (field)						NTU's	
000612	Un-ionized Ammonia as N						Mg/L	
000900	Total Hardness as $CaCO_3$						Mg/L	
000680	Total Organic Carbon						Mg/L	
070300	Total Dissolved Solids						Mg/L	
000530	Total Suspended Solids						Mg/L	
000310	BOD (5 Day) @ 20 ^{o}C						Mg/L	
000340	Chemical Oxygen Demand						Mg/L	
000620	Nitrate as N						Mg/L	
	METALS							
001002	Arsenic						Ug/L	
001027	Cadmium						Ug/L	
001034	Chromium						Ug/L	
001042	Copper						Ug/L	
001045	Iron						Ug/L	
001051	Lead						Ug/L	
071900	Mercury						Ug/L	
000929	Sodium						Ug/L	
001092	Zinc						Ug/L	
	EPA METHOD 601							
073085	Bromochloromethane						Ug/L	

SANLANDO SOFTBALL COMPLEX (CLOSED LANDFILL)

PARAMETER MONITORING REPORT
(Rule 62-701.510)
WACS Report Type: DSSSW
Surface Water Monitoring (Page 3 of 3)

WACS_FACILITY _____ SAMPLE DATE _____

WACS_WELL _____ ANALYSIS DATE _____

MONITORING_SITE_NUM _____ Surface water classification: SW-IIIF

STORET CODE	PARAMETER MONITORED	SAMPLING METHOD	FIELD FILTERED	PRESERVATIVES ADDED	ANALYSIS METHOD	ANALYSIS RESULT	UNITS	DETECTION LIMITS/ UNITS
039180	Trichloroethene						Ug/L	
034488	Trichlorofluoromethane						Ug/L	
039175	Vinyl Chloride						Ug/L	
	EPA METHOD 602							
034030	Benzene						Ug/L	
034371	Ethylbenzene						Ug/L	
034010	Toluene						Ug/L	
034020	Xylenes						Ug/L	

DRAFT

SEMINOLE COUNTY
SOLID WASTE MANAGEMENT FACILITY
(OSCEOLA ROAD SWMF)
SEMI - ANNUAL WATER QUALITY
MONITORING REPORT,
Spring (April) 2005 Sampling Event

Prepared for:

DEPARTMENT OF ENVIRONMENTAL SERVICES
SOLID WASTE DIVISION
SEMINOLE COUNTY, FLORIDA

DRAFT

Prepared by:

THE COLINAS GROUP, INC.
509 N. Virginia Avenue
Winter Park, Florida 32789

July 2005

EXECUTIVE SUMMARY

Osceola Road Landfill
Water Quality Monitoring
Spring (April) 2005 Sampling Event
WACS #26122

INTRODUCTION

The Colinas Group, Inc. (TCG) has reviewed the enclosed groundwater monitoring well sampling and analytical results for the Spring (April) 2005 sampling event at the Osceola Road Landfill. Analytical results were consistent with previous sampling events completed at the landfill.

No significant change in groundwater quality at the Osceola Landfill was observed in the data reviewed for this reporting period.

SAMPLING EVENT

The sampling event at the Osceola Landfill occurred during the period April through June 2005. Routine sampling was completed from April 18 to May 2; supplementary resampling on two monitoring well was completed on June 17 and 28, 2005.

Water level measurements and water sampling were performed by TCG personnel in accordance with the latest issue of Florida Department of Environmental Protection Standard Operating Procedures (SOP) for Field Activities. Water samples collected from the facility groundwater monitoring wells and from a surface water station were tested for the required field parameters. Monitoring wells were purged and the groundwater discharge allowed to stabilize prior to sample collection. The results of this field testing were recorded as part of the Field Reports (Attachment 4) and are listed in Table I. All samples were preserved and stored as required prior to shipment to the analytical laboratory.

Laboratory analytical services were provided by USBiosystems, Inc., Boca Raton, Florida, in accordance with the laboratory's FDEP-approved ComQAP #980126 and FDHRS Certification #E86240. The original analytical reports prepared by USBiosystems are formatted to conform with DEP Form 62-522.900(2) and are presented in Attachment 2 to this report.

Water table depth measurements in each facility groundwater monitoring well were recorded during an 8-hour period on March 30, 2005. These measurements were used to

develop the water table elevation and potentiometric surface maps of the water table and intermediate artesian aquifers monitored at the landfill presented in Attachment 1. Depth to water measurements and elevations are listed in Table III.

Water levels in the Hydraulic Monitoring System piezometers are measured once monthly and recorded by county personnel. Recorded water levels at each of the sixteen (16) piezometers for the previous six-month period November 2004 through April 2005 are presented in Attachment 6 to this report.

Seminole County mulches wood waste received as land clearing debris and stockpiles the mulch in the eastern portion of the landfill property. Processed mulch is made available to citizens for landscaping use. To ensure that mulch contaminated with arsenic and chromium is not provided to the public, the county conducts random testing of the mulch stockpile. Results of mulch testing are included in Attachment II.

Leachate pumped from the perimeter leachate collection system is routed to on-site storage tanks for transfer to a county-operated wastewater treatment facility. Samples of leachate were collected at the storage tanks and analyzed in the laboratory for constituents listed in the landfill FDEP operating permit. Laboratory results are included in Attachment II.

RESULTS

Groundwater Movement

Water table elevations in the shallow surficial aquifer are presented in map form in Attachment 1. The map shows the location and distribution of surficial aquifer monitoring wells across the landfill and measured water table elevations on March 30, 2005. Since the landfill perimeter slurry wall fully penetrates the surficial aquifer sediments, the wall is an effective groundwater dam inhibiting the natural flow of groundwater in the aquifer from generally west to east.

Elevations on the water table surface ranged from 19.38 ft. to 14.17 ft.+NGVD in the surficial aquifer. Water level measurements indicate a general west to east movement of groundwater around the landfill. Highest water table elevations occur to the south and west of the landfill (18 to 19 ft.+NGVD). The lowest water table elevations are noted along the northeast margin of the landfill (14.28 ft.+NGVD) and immediately south of the C&D Handling Area (14.17 ft.+NGVD) south of the Class I landfill.

Contours on the potentiometric surface of the intermediate aquifer, unaffected by the groundwater dam effects of the slurry wall, are shown on the Intermediate Aquifer groundwater contour map presented in Attachment 1. A shallow, yet distinct, hydraulic

gradient in the aquifer is noted from west to east across the landfill. Water levels in the intermediate (deeper) wells are generally less than 1 to greater than 3 feet lower than water table elevations at shallow wells.

Field Tested Parameters

Results of field testing completed at groundwater monitoring wells as part of the Spring (April) 2005 sampling event are summarized in Table I. Field tests were completed by TCG sampling personnel in accordance with the requirements of the FDEP SOP for Field Activities.

pH

The field testing results indicate pH of groundwater in the uppermost (water table) aquifer generally ranged through the acidic to slightly basic end of the FDEP secondary standard of 6.5 - 8.5 pH units. Measured pH was lower (acidic) than 6.5 at six (6) of the 19 water table aquifer monitoring wells (S-series) and at four (4) of the 17 intermediate aquifer wells (i-series) sampled.

Slightly acidic to acidic pH is considered natural for groundwater in the shallow and intermediate aquifers monitored by the landfill wells. Groundwater pH was below 6.5 pH units at all four of the facility background monitoring wells (MW-1s/1i and MW-15S/15i). None of the pH measurements ranged above the upper end of the secondary standard pH range.

The pH of surface water at station SW-8 was measured at a neutral 7.02 pH units.

Fluid Temperature

Temperature of each water sample was measured in the field immediately following collection in a laboratory container. Temperature measurements of groundwater from the monitoring wells ranged between 20.6 to 23.6 C, slightly warmer (2 to 4 degrees C) than in October 2004, reflecting the previous six months of cooler winter and early spring air temperatures.

Dissolved Oxygen

Dissolved oxygen (DO) was reported at concentrations exceeding the FDEP sampling guidance level of 20% saturation in groundwater samples from two monitoring wells, MW-8S and MW-11S. DO at the remaining 34 wells was below 20% saturation for the given water temperatures.

Specific Conductance

Specific conductance of groundwater samples collected during this sampling event ranged from a low of 70 umhos/cm to 1,540 umhos/cm. Measured specific conductance values appear to correlate well with analyzed total dissolved solids (TDS) concentrations.

Turbidity

The FDEP recommends attainment of turbidity values less than 20 NTUs in groundwater samples obtained from monitoring wells. As shown in Table I, 33 groundwater monitoring well samples collected had measured turbidity values less than 20 NTUs. Elevated turbidity levels were recorded at wells MW-1i (27 NTUs), MW-9i (35 NTUs) and MW-15S (34.3 NTUs).

Regulatory Exceedances

A summary of groundwater analytical results that exceeded the regulatory level for the particular parameter in the April 2005 sample set is presented in Table II.

Ammonia Nitrogen

Ammonia nitrogen was measured in samples from six (6) shallow water table aquifer wells, including shallow background monitoring well MW-1S, at concentrations above the FDEP groundwater cleanup target level (guidance concentration) of 2.8 mg/l. Ammonia concentrations were below 2.8 mg/l in all intermediate aquifer monitoring wells and at surface water station SW-8.

Arsenic

Arsenic was detected at concentrations above the recently-amended Florida Primary Drinking Water Standards MCL of 10 ug/l in groundwater samples from seven (7) facility monitoring wells. Three (3) of the wells are shallow zone wells, including background well MW-15S. The remaining four (4) are intermediate zone monitoring wells. Reported arsenic concentrations ranged from 16 ug/l to 39 ug/l (MW-15S) in the shallow wells and between 13 ug/l to 26 ug/l in the intermediate zone wells.

Iron

Dissolved iron in groundwater is ubiquitous at relatively high concentrations throughout the landfill monitoring network. Concentrations of dissolved iron exceeded the Florida Secondary Drinking Water Standards MCL of 300 ug/l in all wells except MW-4S. Each of the two shallow and intermediate zone background wells produced groundwater with elevated iron concentrations above 300 ug/l. Elevated iron levels are common in shallow groundwaters throughout central Florida, especially in areas with relatively high water tables near land surface and copious organic (vegetation) debris. Measured iron concentrations are consistent with previous monitoring results at the landfill.

Nitrate Nitrogen

Nitrate nitrogen was detected in shallow well MW-14S at a concentration of 13 mg/l and in shallow well MW-20S at 76 mg/l. The FPDWS MCL for nitrate nitrogen is 10 mg/l. Both wells were resampled within 30 days of receipt of the laboratory reports. Resampling results were: MW-14S - nitrate at 200 mg/l; MW-20S - nitrate at below laboratory detection limit.

During the sampling events TCG noted that the metal well cover on MW-14S was broken and the top of the well (fitted with a Well Wizard Pump mounting flange) was open to the air. The top of the well and pump mounting flange was found covered with excrement from turkey vultures roosting on the wellhead. Apparently, MW-14S in located in an area of the landfill frequented by the resident turkey vulture population.

Review of historical landfill monitoring results indicates that nitrate nitrogen has never been detected above laboratory detection limits in groundwater samples from MW-14S and nearby monitoring wells. The unusually-high nitrate analysis from the resample event and evidence of vulture feces covering the wellhead strongly suggests a direct relationship.

Total Dissolved Solids

Total dissolved solids (TDS) exceeded the secondary provisional MCL (500 mg/l) at roughly 39 percent of the monitoring wells sampled during this event (14 out of 36 wells). Twelve (12) of these wells are shallow aquifer wells.

Volatile Organic Compounds

Analyzed volatile organic compounds were below laboratory method detection limits in all groundwater and surface water samples collected during this sampling event.

Landfill Leachate Sample Analysis Summary

A composite sample of landfill leachate was collected by TCG at the facility leachate storage tanks. The laboratory results of analyses for the leachate sample are included in Attachment 2 as Sample L-1. The list of parameters analyzed is required for semi-annual submission to the Seminole County wastewater treatment facility in accordance with the landfill Industrial Pretreatment Permit #0197.

The laboratory reports lead in the leachate sample at a concentration of 92 ug/l, exceeding the FPDWS MCL (15 ug/l). Leachate pH was slightly basic at 7.75 pH units.

Random Wood Mulch Sampling

A composite wood mulch sample was constructed from random sampling within the existing wood mulch storage pile at the landfill. The composite sample was preserved and sent for analysis in the laboratory for arsenic and chromium. The laboratory reports arsenic at below the method detection limit (not detected). Chromium was reported at a concentration of 1500 ug/kg (1.5 mg/kg).

Landfill Hydraulic Monitoring System (HMS)

Monthly reports of measured groundwater elevations at the HMS piezometers around the landfill are presented for the 6-month period November 2004 through April 2005 in Attachment 7 of this report. The reports include water level measurements as depth to water in each of the 16 piezometers and conversion to water elevation in feet above NGVD(1929).

The HMS piezometer measurements indicate that the leachate collection system is consistently maintaining an inward hydraulic gradient on the water table surface across the slurry wall at all 8 HMS stations, even under periods of unusually heavy rainfall.

SUMMARY

Chemical characteristics of surface water and groundwater monitored at the Osceola Road SWMF have remained relatively unchanged from previous sampling events. Test results for the current event are generally consistent with water quality and analytical results from the previous event in October 2004. Current water quality laboratory results indicate that the Osceola Road SWMF is not having an adverse impact on the quality of groundwaters and surface waters at and near the facility.

Arsenic was detected in groundwater from seven (7) monitoring wells (3 shallow and 4 intermediate zone) situated around the landfill at concentrations exceeding the new FPDWS MCL of 10 ug/l. The highest arsenic concentration (39 ug/l) was reported for shallow background well MW-15S.

Historical monitoring data for the landfill suggests that arsenic may be naturally-occurring at low concentrations considering past detections above 10 ug/l in groundwater from facility background monitoring wells. Arsenic may occur in phosphatic minerals associated with the Hawthorn Group sediments known to occur at shallow depths in the vicinity of the Osceola Road SWMF. Arsenic may also be present naturally from seawater trapped in sediments when sea levels were much higher and by aerosol drift from the nearby east coast.

Ammonia nitrogen concentrations above the FDEP guidance level of 2.8 mg/l were reported in groundwater at six (6) shallow monitoring wells, ranging from 3.3 mg/l to 26 mg/l. Ammonia exceeded the guidance level at shallow background well MW-1S at 3.9 mg/l.

Nitrate nitrogen was reported at concentrations of 13 mg/l and 200 mg/l in groundwater samples from shallow monitoring well MW-14S. During sampling TCG noted that the well cover was broken and the wellhead exposed and covered with excrement from turkey vultures. Bird excrement in the well is considered the most likely cause of elevated nitrate, considering the conditions noted at the wellhead and the lack of nitrate nitrogen concentrations in this and nearby wells in past sampling events. The wellhead has since been repaired and the locking cover replaced to prevent future occurrences.

HMS water level data indicate the landfill leachate collection system is effectively controlling water table levels inside the perimeter slurry wall. The system continues to operate in accordance with the performance requirements of the Osceola Road SWMF FDEP Operating Permit.

Laboratory analysis of random samples from wood mulch produced at the facility indicate that concentrations of arsenic and chromium were less than the laboratory method detection limits. Neither element was detected in the mulch samples.

TABLE I
FIELD ANALYSIS PARAMETERS
OSCEOLA ROAD LANDFILL
Spring (April) 2005

Well No.	Temp. (C)	Diss. Oxy. (mg/l)	pH (su)	Sp. Cond. (umhos/cm)	Turbidity (NTU)
MW-1s	21.9	0.03	**6.20**	458	4.84
MW-1i	22.6	0.04	**6.18**	210	**27.0**
MW-2s	21.3	0.19	6.53	621	2.58
MW-2i	22.5	0.07	**5.37**	123	13.2
MW-3s	21.4	0.10	6.65	1540	12.0
MW-3i	22.6	0.07	**6.23**	121	3.19
MW-4s	21.6	0.19	7.26	339	14.1
MW-4i	23.2	0.04	7.17	449	1.10
MW-5s	21.8	0.13	7.14	1050	8.52
MW-5i	23.4	0.01	7.02	470	11.9
MW-6s	22.2	0.01	**6.32**	1240	3.20
MW-6i	23.6	0.10	7.02	492	5.76
MW-7s	22.8	0.08	6.60	269	9.83
MW-7i	24.1	0.04	7.27	549	8.42
MW-8s	22.6	**1.78**	**6.09**	610	19.1
MW-8i	23.5	0.03	7.09	477	12.6
MW-9s	22.3	0.33	6.91	536	1.86
MW-9i	23.1	0.06	7.13	423	**35.0**
MW-10s	21.2	0.01	**6.45**	442	2.84
MW-10i	22.6	0.16	7.17	1060	1.40
MW-11s	21.2	**2.26**	6.81	441	2.37
MW-11i	22.8	0.03	7.38	581	17.4
MW-12s	21.1	0.02	6.81	1150	6.37
MW-12i	22.4	0.03	7.26	1310	2.58
MW-13s	22.4	0.84	6.62	1190	1.41
MW-13i	23.4	0.02	7.13	498	4.47

Well No.	Temp. (C)	Diss. Oxy. (mg/l)	pH (su)	Sp. Cond. (umhos/cm)	Turbidity (NTU)
MW-14s	20.6	0.10	6.87	1000	3.57
MW-14i	22.7	0.04	7.31	580	19.9
MW-15s	21.1	0.46	**5.53**	83	**34.3**
MW-15i	23.3	0.18	**5.51**	70	7.73
MW-17s	20.9	0.08	6.73	1280	2.03
MW-17i	22.4	0.06	7.52	366	19.6
MW-19s	22.3	0.30	**6.30**	385	16.9
MW-20s	22.5	0.04	6.82	940	3.35
MW-21s	22.2	0.24	6.79	816	17.3
MW-21i	23.3	0.13	7.40	347	16.0
SW-8					

Notes: **Bold lettering** indicates: pH exceeds SDWS pH range (6.5 - 8.5 ph units).
Turbidity exceeds FDEP recommended 20 NTUs.
Dissolved oxygen exceeded 20% saturation.

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TABLE II
SUMMARY OF EXCEEDEANCES
OSCEOLA ROAD SWMF
Spring (April) 2005

Monitoring Well No.	Exceeded Parameter	Parameter Concentration	Guidance / MCL Concentration	Regulatory Level
MW-1S	pH Ammonia, as N Iron	6.20 pH units 3.9 mg/l 12,000 ug/l	>6.5 pH units 2.8 mg/l 300 ug/l	Secondary Guidance Secondary
MW-1I	pH Iron	6.18 pH units 6,700 ug/l	>6.5 pH units 300 ug/l	Secondary Secondary
MW-2S	Ammonia, as N TDS Iron	4.2 mg/l 530 mg/l 5,700 ug/l	2.8 mg/l 500 mg/l 300 ug/l	Guidance Secondary Secondary
MW-2I	pH Iron	5.37 pH units 8,300 ug/l	>6.5 pH units 300 ug/l	Secondary Secondary
MW-3S	**Arsenic** Ammonia, as N TDS Iron	**21 ug/l** 6.2 mg/l 800 mg/l 46,000 ug/l	**10 ug/l** 2.8 mg/l 500 mg/l 300 ug/l	**Primary** Guidance Secondary Secondary
MW-3I	pH Iron	6.23 pH units 2,600 ug/l	>6.5 pH units 300 ug/l	Secondary Secondary
MW-4I	Iron	2,300 ug/l	300 ug/l	Secondary
MW-5S	TDS Iron	550 mg/l 30,000 ug/l	500 mg/l 300 ug/l	Secondary Secondary
MW-5I Resample (5-17-05)	**Antimony** **Arsenic** Iron Antimony	**7.0 ug/l** **26 ug/l** 24,000 ug/l BDL	**6.0 ug/l** **10 ug/l** 300 ug/l 6.0 ug/l	**Primary** **Primary** Secondary Primary
MW-6S	pH Ammonia, as N TDS Iron	6.32 pH units 3.3 mg/l 780 mg/l 40,000 ug/l	>6.5 pH units 2.8 mg/l 500 mg/l 300 ug/l	Secondary Guidance Secondary Secondary
MW-6I	**Arsenic** Iron	**21 ug/l** 22,000 ug/l	**10 ug/l** 300 ug/l	**Primary** Secondary

MW-7S	Iron	4,200 ug/l	300 ug/l	Secondary
MW-7I	**Arsenic** Iron	**18 ug/l** 22,000 ug/l	**10 ug/l** 300 ug/l	**Primary** Secondary
MW-8S	pH Ammonia, as N TDS Iron	6.09 pH units 26 mg/l 630 mg/l 36,000 ug/l	>6.5 pH units 2.8 mg/l 500 mg/l 300 ug/l	Secondary Guidance Secondary Secondary
MW-8I	Iron	18,000 ug/l	300 ug/l	Secondary
MW-9S	**Arsenic** Iron TDS	**16 ug/l** 1,700 ug/l 590 mg/l	**10 ug/l** 300 ug/l 500 mg/l	**Primary** Secondary Secondary
MW-9I	Iron	6,100 ug/l	300 ug/l	Secondary
MW-10S	pH Iron	6.45 pH units 5,200 ug/l	>6.5 pH units 300 ug/l	Secondary Secondary
MW-10I	Iron TDS	630 mg/l 660 mg/l	300 mg/l 500 ug/l	Secondary Secondary
MW-11S	Iron	8,200 mg/l	300 mg/l	Secondary
MW-11I	**Arsenic** Iron	**13 ug/l** 6,200 ug/l	**10 ug/l** 300 ug/l	**Primary** Secondary
MW-12S	Ammonia, as N TDS Iron	19 mg/l 740 mg/l 76,000 ug/l	2.8 mg/l 500 mg/l 300 ug/l	Guidance Secondary Secondary
MW-12I	TDS Iron	790 mg/l 4,000 ug/l	500 mg/l 300 ug/l	Secondary Secondary
MW-13S	TDS Iron	560 mg/l 15,000 ug/l	500 mg/l 300 ug/l	Secondary Secondary
MW-13I	Iron	1,000 ug/l	300 ug/l	Secondary
MW-14S Resample (6-17-05)	TDS Iron **Nitrate, as N** **Nitrate, as N**	590 mg/l 2,500 ug/l **13 mg/l** **200 mg/l**	500 mg/l 300 ug/l **10 mg/l** **10 mg/l**	Secondary Secondary **Primary** **Primary**
MW-14I	Iron	7,400 ug/l	300 ug/l	Secondary

MW-15S	**Arsenic** pH Iron	**39 ug/l** 5.53 pH units 6,200 ug/l	**10 ug/l** >6.5 pH units 300 ug/l	**Primary** Secondary Secondary
MW-15I	pH Iron	5.51 pH units 4,600 ug/l	>6.5 pH units 300 ug/l	Secondary Secondary
MW-17S	TDS Iron	670 mg/l 26,000 ug/l	500 mg/l 300 ug/l	Secondary Secondary
MW-17I	Iron	1,200 ug/l	300 ug/l	Secondary
MW-19S	pH Iron	6.30 pH units 860 ug/l	>6.5 pH units 300 ug/l	Secondary Secondary
MW-20S Resample (6-28-05)	TDS Iron **Nitrate, as N** Nitrate, as N	570 mg/l 15,000 ug/l **76 mg/l** BDL	500 mg/l 300 ug/l **10 mg/l** 10 mg/l	Secondary Secondary **Primary** Primary
MW-21S	TDS Iron	700 mg/l 8,400 ug/l	500 mg/l 300 ug/l	Secondary Secondary
MW-21I	Iron	940 ug/l	300 ug/l	Secondary
SW-8	Iron	620 ug/l	>6.5 pH units	Secondary
Leachate L-1	**Lead**	**92 ug/l**	**15 ug/l**	**Primary**

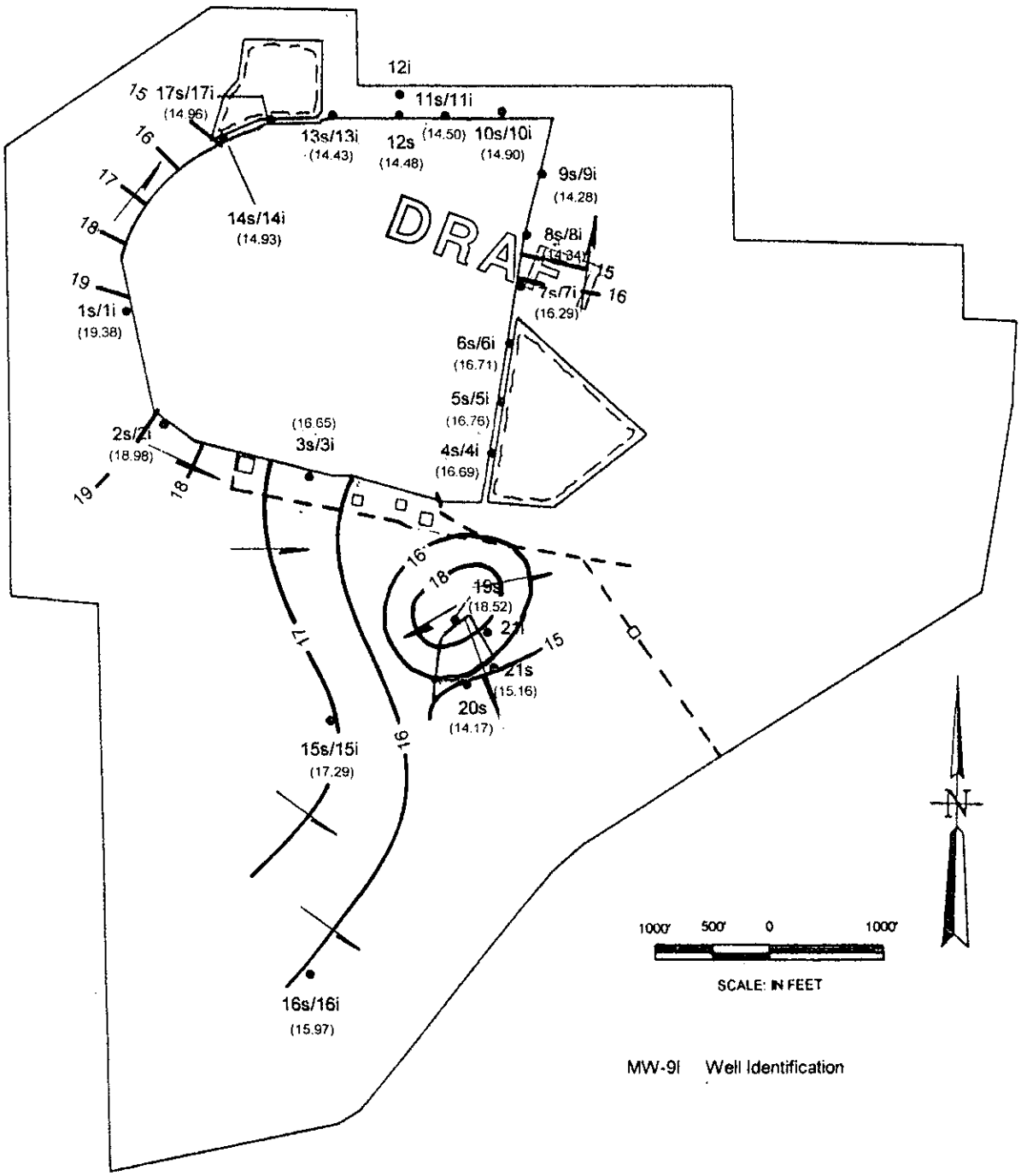
Notes: **Boldface Type** indicates analytical result exceeds Primary Drinking Water Standards MCL.

TABLE III
SUMMARY OF GROUNDWATER ELEVATIONS
OSCEOLA LANDFILL
March 30, 2005

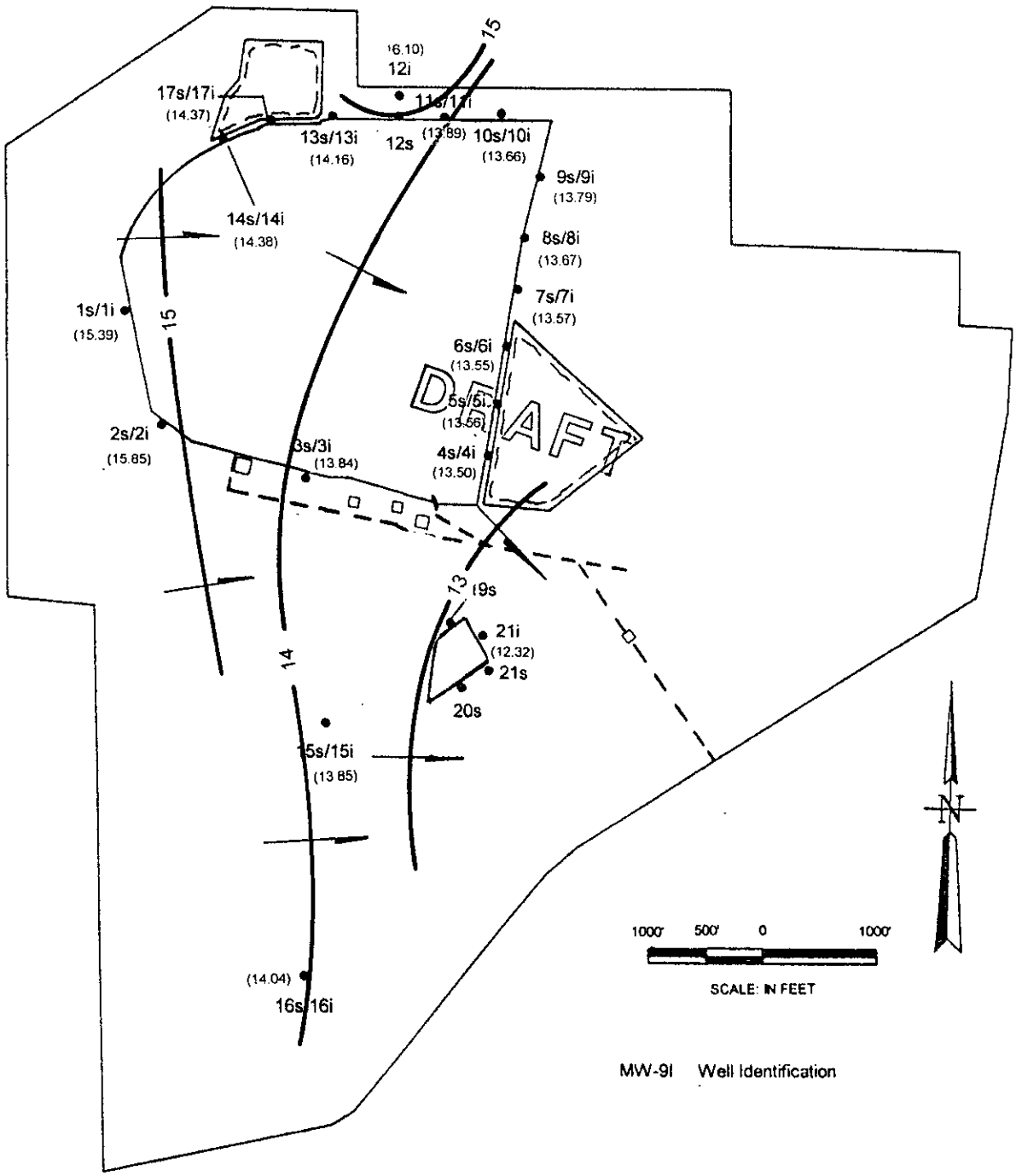
Well No.	Top of Casing (Ft.+NGVD)	Depth to Water (Ft.-TOC)	Groundwater Elevation (Ft.+NGVD)	Total Well Depth (Feet)
MW-1S	25.11	5.73	19.38	22.1
MW-1I	23.43	8.04	15.39	45.6
MW-2S	25.61	6.63	18.98	20.6
MW-2I	25.22	9.37	15.85	46.0
MW-3S	22.45	5.80	16.65	19.5
MW-3I	22.17	8.33	13.84	38.3
MW-4S	22.36	5.67	16.69	15.3
MW-4I	22.21	8.71	13.50	45.0
MW-5S	22.94	6.18	16.76	15.6
MW-5I	23.13	9.57	13.56	41.5
MW-6S	22.50	5.79	16.71	22.5
MW-6I	22.65	9.10	13.55	49.5
MW-7S	22.05	5.76	16.29	17.2
MW-7I	22.21	8.64	13.57	42.3
MW-8S	21.13	6.79	14.34	16.8
MW-8I	21.25	7.58	13.67	47.6
MW-9S	18.72	4.44	14.28	12.1
MW-9I	22.27	8.48	13.79	58.1
MW-10S	18.86	3.96	14.90	12.6
MW-10I	20.22	6.56	13.66	39.7
MW-11S	19.14	4.64	14.50	14.2
MW-11I	21.28	7.39	13.89	37.4
MW-12S	19.40	4.92	14.48	15.4
MW-12I	22.48	6.38	16.10	40.0
MW-13S	20.48	6.05	14.43	15.2
MW-13I	21.03	6.87	14.16	45.1
MW-14S	19.67	4.74	14.93	14.1

Well No.	Top of Casing (Ft.+NGVD)	Depth to Water* (FT.-TOC)	Groundwater Elevation (Ft.+NGVD)	Total Well Depth (Feet)
MW-14I	19.82	5.44	14.38	38.7
MW-15S	24.15	6.86	17.29	20.2
MW-15I	24.14	10.29	13.85	39.7
MW-16S	20.46	4.49	15.97	22.1
MW-16I	20.47	6.43	14.04	44.4
MW-17S	19.23	4.27	14.96	18.1
MW-17I	20.16	5.79	14.37	46.3
MW-19S	26.71	8.19	18.52	15.3
MW-20S	25.78	11.61	14.17	20.0
MW-21S	24.56	9.40	15.16	56.8
MW-21I	25.01	12.69	12.32	55.7

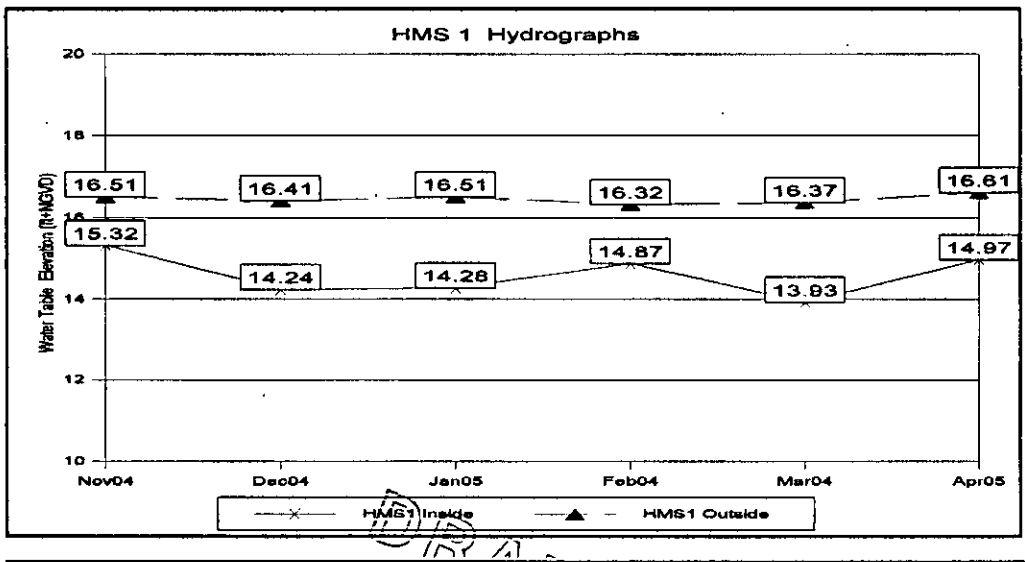
* Water levels measured on March 30, 2005

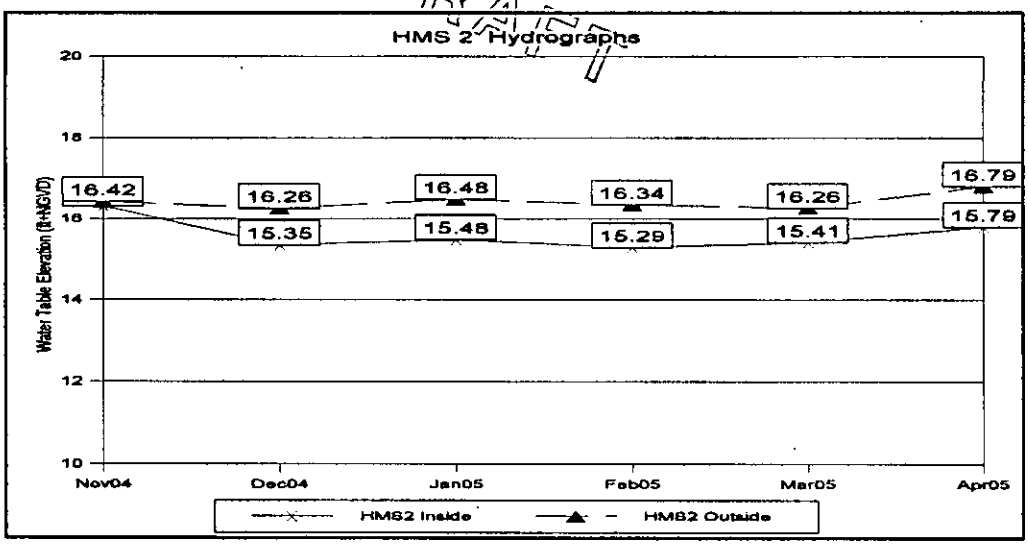


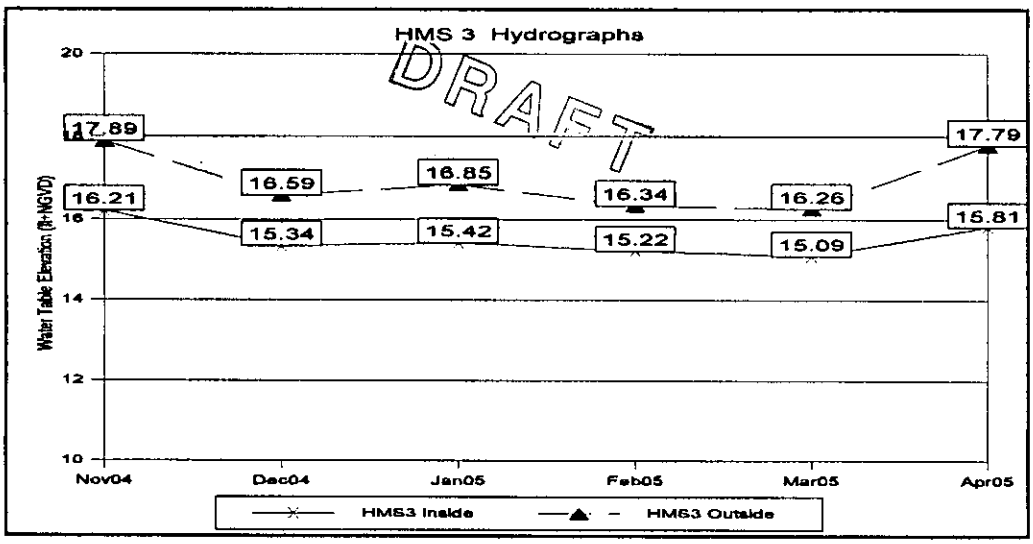
PROJ. NO. P-291 DATE: June 16, 2005 SCALE: Noted **THE COLINAS GROUP**	**OSCEOLA LANDFILL** **Surficial Aquifer Contour Map (April 2005)** **FIGURE 1**

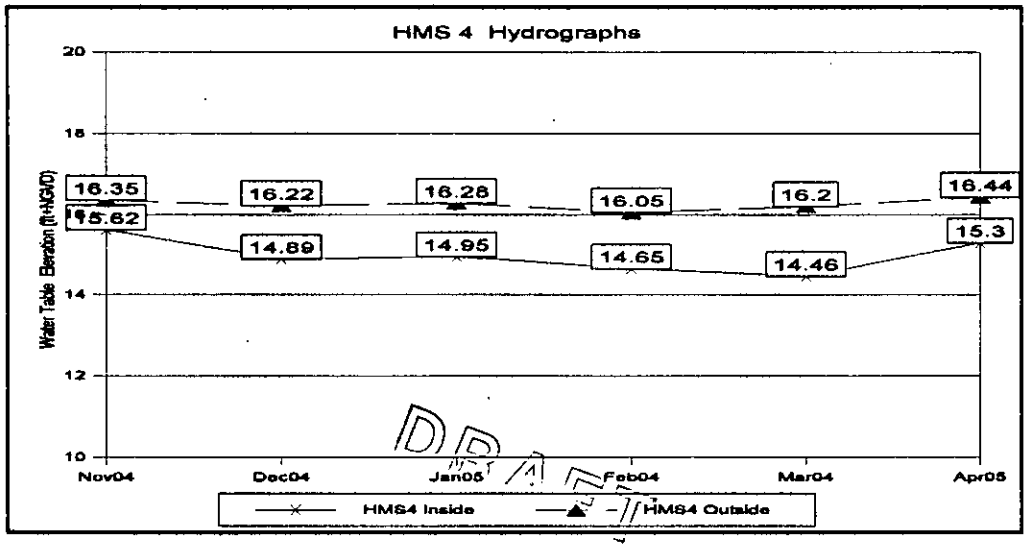


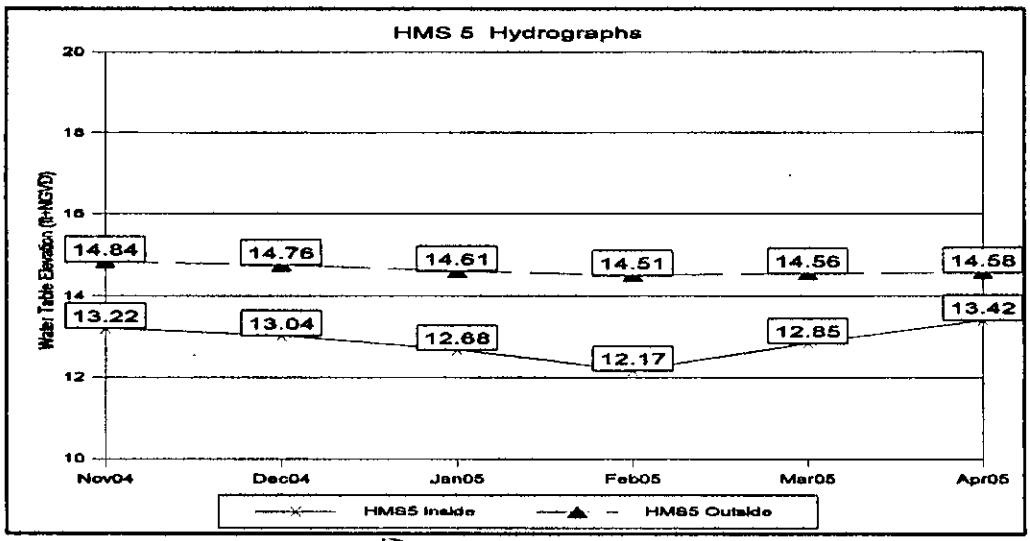
PROJ. NO. P-291 DATE: June 16, 2005 SCALE: Noted **THE COLINAS GROUP**	**OSCEOLA LANDFILL** **Intermediate Aquifer Contour Map (April 2005)** **FIGURE 2**

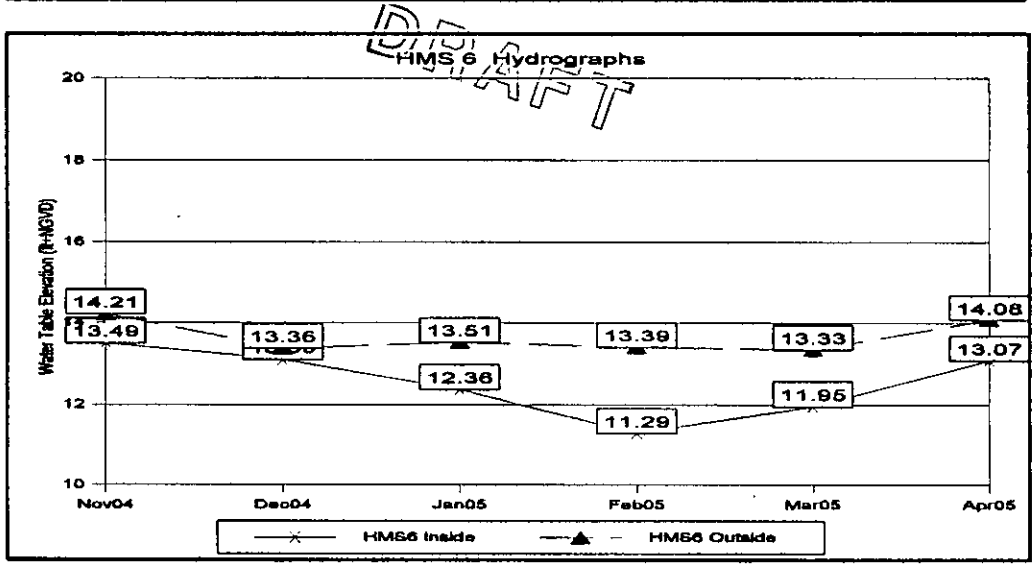

HMS 1 Hydrographs
Water Table Elevation (ft+NGVD)
20
18
16
14
12
10
16.51
16.41
16.51
16.32
16.37
16.61
15.32
14.24
14.28
14.87
13.93
14.97
Nov04
Dec04
Jan05
Feb04
Mar04
Apr05
HMS1 Inside
HMS1 Outside


HMS 2 Hydrographs
Water Table Elevation (ft+NGVD)
20
18
16
14
12
10
16.42
16.26
16.48
16.34
16.26
16.79
15.35
15.48
15.29
15.41
15.79
Nov04
Dec04
Jan05
Feb05
Mar05
Apr05
HMS2 Inside
HMS2 Outside


HMS 3 Hydrographs
Water Table Elevation (ft+NGVD)
20
18
16
14
12
10
17.89
16.59
16.85
16.34
16.26
17.79
16.21
15.34
15.42
15.22
15.09
15.81
Nov04
Dec04
Jan05
Feb05
Mar05
Apr05
HMS3 Inside
HMS3 Outside


HMS 4 Hydrographs
Water Table Elevation (ft-NGVD)
20
18
16
14
12
10
16.35
16.22
16.28
16.05
16.2
16.44
15.62
14.89
14.95
14.65
14.46
15.3
Nov04
Dec04
Jan05
Feb04
Mar04
Apr05
HMS4 Inside
HMS4 Outside


HMS 5 Hydrographs
Water Table Elevation (ft-NGVD)
20
18
16
14
12
10
14.84
14.76
14.61
14.51
14.56
14.58
13.22
13.04
12.68
12.17
12.85
13.42
Nov04
Dec04
Jan05
Feb05
Mar05
Apr05
HMS5 Inside
HMS5 Outside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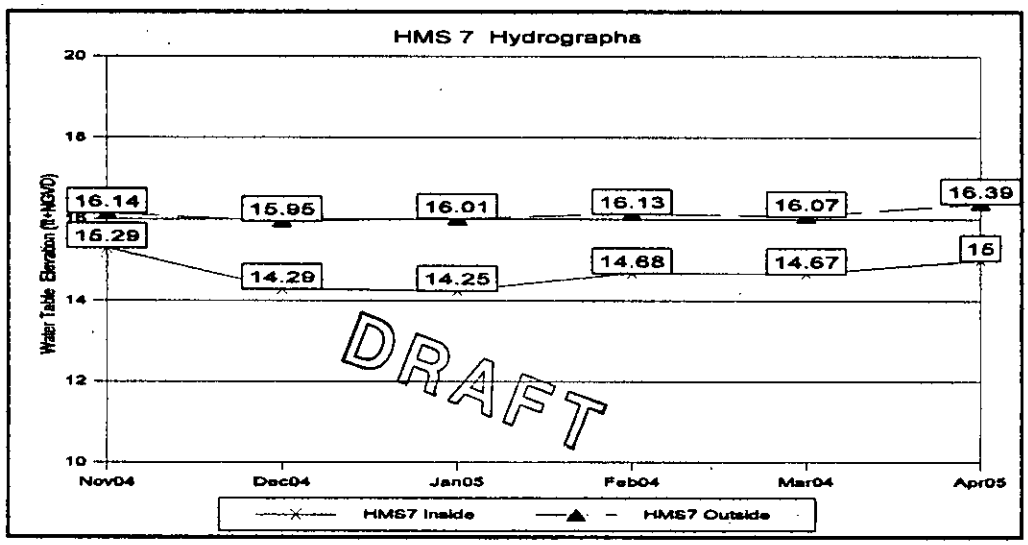
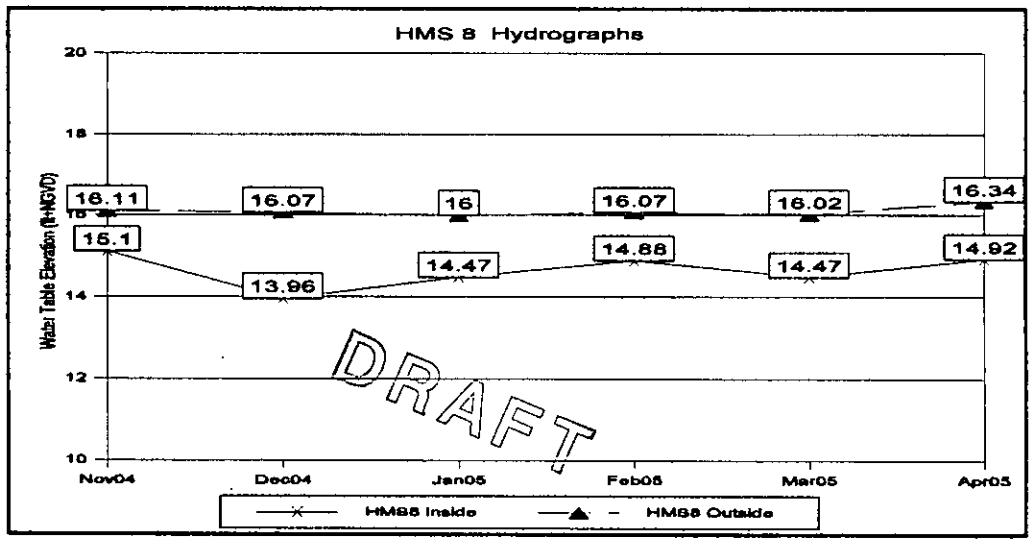
Water Table Elevation (ft-NGVD)
20
18
16
12
10
14.21
13.49
13.36
13.51
13.39
13.33
14.08
13.07
12.36
11.29
11.95
Nov04
Dec04
Jan05
Feb05
Mar05
Apr05
HMS6 Inside
HMS6 Outside


HMS 7 Hydrographs
Water Table Elevation (ft+NGVD)
20
18
16
14
12
10
16.14
15.95
16.01
16.13
16.07
16.39
15.29
14.29
14.25
14.68
14.67
15
Nov04
Dec04
Jan05
Feb04
Mar04
Apr05
HMS7 Inside
HMS7 Outside
DRAFT


HMS 8 Hydrographs
Water Table Elevation (ft+NGVD)
20
18
16
14
12
10
16.11
16.07
16
16.07
16.02
16.34
15.1
13.96
14.47
14.88
14.47
14.92
Nov04
Dec04
Jan05
Feb05
Mar05
Apr05
HMS8 Inside
HMS8 Outside
DRAFT

DRAFT

SEMINOLE COUNTY
SANLANDO (CLOSED) LANDFILL
SEMI - ANNUAL GROUNDWATER MONITORING REPORT,
Spring (February) 2005 Sampling Event

Prepared for:

SEMINOLE COUNTY, FLORIDA
Environmental Services Department
Solid Waste Division

DRAFT

Prepared by:

THE COLINAS GROUP, INC.
509 N. Virginia Avenue
Winter Park, Florida 32789

April 2005

SANLANDO (CLOSED) LANDFILL
SEMI-ANNUAL GROUNDWATER MONITORING REPORT,
SEMINOLE COUNTY, FLORIDA
Spring (February) 2005

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EXECUTIVE SUMMARY

Sanlando (Closed) Landfill
Water Quality Monitoring Report
Spring (February) 2005 Sampling Event
WACS #83417

INTRODUCTION

The Colinas Group, Inc. (TCG) has reviewed the enclosed surface water and groundwater monitoring well sampling and analytical results for the Spring (February) 2005 sampling event at the Sanlando Closed Landfill. Results were consistent with previous sampling events completed at the closed landfill except at monitoring well MW-2. Nitrate nitrogen concentrations in this well ranged from 50 to 55 mg/l (values from resampling and initial sampling, respectively) significantly higher than previous sampling results from the Fall 2004 sampling event. No other significant change in surface water and groundwater quality at the Sanlando Landfill was observed in the data reviewed for this reporting period.

SAMPLING EVENT

The sampling event at the Sanlando Landfill occurred on February 16 and 17, 2005. All sampling was performed by TCG personnel in accordance with the latest issue of the Florida Department of Environmental Protection (FDEP) Standard Operating Procedures (SOP) for Field Activities. Water samples collected from the adjacent channel of the Little Wekiva River and from the facility groundwater monitoring wells were tested for the required field parameters. Monitoring wells were purged and the groundwater discharge allowed to stabilize prior to sample collection. The results of this field testing were recorded as part of the Field Reports (Attachment 4) and are listed in Table I. All samples were preserved and stored as required prior to shipment to the analytical laboratory.

Gas concentrations were measured by Seminole County personnel at seven (7) landfill gas monitoring stations around the landfill. Gas monitoring results for February 2005 are presented in Attachment 6.

Laboratory analytical services were provided by U.S. Biosystems, Inc. in accordance with the laboratory's FDEP-approved ComQAP #980126 and FDHRS Certification #E86240. The original analytical reports prepared by U.S.Biosystems are formatted to conform with DEP Form 62-522.900(2) and are presented in Attachment 2 to this report.

Water table depth measurements in each facility groundwater monitoring well and piezometer were recorded on February 17, 2005. Water level measurements were used

to develop the Water Table Elevation Contour Map (Attachment 1) for the uppermost receiving groundwater aquifer beneath the site. Depth to water table measurements and corresponding water table surface elevations are listed in Table II.

Surface water elevations in the adjacent Little Wekiva River channel are no longer measured by the County as the permanent staff gauges at stations SW-1 and SW-2 are prone to vandalism and seldom, if ever, remain standing for long after reinstallation. Given the chronic problems with maintaining accurate staff gauges at the surface water sampling stations, the County has ceased reinstallation and reading of the gauges. Accurate water level measurements are available from a U.S. Geological Survey instrument station located on the Little Wekiva River at S.R.434, less than 1,000 feet downstream from the closed landfill.

RESULTS

Field Tested Parameters

Results of field testing completed at groundwater and surface water monitoring sites for the Spring (February) 2005 sampling event are summarized in Table I. Field tests were completed by TCG sampling personnel.

pH

The field testing results indicate pH of groundwater in the uppermost aquifer ranged between the upper and lower FDEP secondary standard of 6.5 - 8.5 pH units at five (5) of the seven (7) groundwater monitoring wells sampled during the February 2005 event. Measured pH was below the lower pH range (slightly acidic) at the facility background monitoring well (MW-1) at 5.62 pH units and at downgradient monitoring well MW-5 at 6.45 pH units.

Fluid Temperature

Temperature of each groundwater sample was measured in the field at the bladder pump discharge. Temperature measurements of groundwater from the seven (7) monitoring wells were similar, ranging between 23.0 to 24.3 C.

Dissolved Oxygen

Dissolved oxygen (DO) exceeded the FDEP sampling guidance level of 20% saturation in two (2) of the seven (7) of the monitoring wells tested during the sampling event. Dissolved oxygen concentrations were below 20% saturation at all wells except the facility background well MW-1, and downgradient monitoring well MW-3.

Specific Conductance

Specific conductance of groundwater and surface water samples collected during this sampling event are consistent with historical values and trends measured at facility monitoring points. Historically, the monitoring wells may be divided into two groups based on specific conductance: Wells MW-1 and MW-3 produce groundwater with similar relatively low values, and; MW's 2, 4, 5, 6 and 7, with relatively high values. A similar distribution of specific conductance is apparent in the test results from this sampling event, as shown on Table I.

Turbidity

The FDEP recommends attainment of turbidity values less than 20 NTUs in groundwater samples obtained from monitoring wells. As shown in Table I, groundwater samples collected had measured turbidity values less than 20 NTUs.

Regulatory Exceedances

A summary of groundwater and surface water analytical results that exceeded the regulatory level for the particular parameter in the Spring (February) 2005 sample set is presented in Table III. As shown, several indicator parameters were reported at concentrations that exceed applicable regulatory levels.

Aluminum

Aluminum was detected above the Secondary Drinking Water Standards (SDWS) MCL (200 ug/l) in the facility background monitoring well MW-1 at 470 ug/l. Aluminum in groundwater upgradient from the landfill is most likely the result of leaching from naturally-occurring aluminum-silicate clay minerals commonly found in Florida sediments.

Ammonia Nitrogen

Ammonia nitrogen was measured in samples from four (4) wells (MW-4, -5, -6 and -7) at concentrations above the FDEP groundwater cleanup target level (2.8 mg/l). Ammonia levels in MW-4 and MW-5 are consistent with trends at these wells since 1997. Well MW-4 recorded the highest ammonia concentration at 43 mg/l.

Ammonia concentration at monitoring well MW-7 was reported at 9.4 mg/l during the prior sampling event in March 2004 and was below the laboratory method detection limit in the November 2004 sampling event results. Ammonia was measured by the laboratory at 19 mg/l in MW-7 in this sampling event.

Arsenic

Arsenic was detected above the recently amended Primary Drinking Water Standards (PDWS) MCL of 10 ug/l for arsenic in two (2) downgradient monitoring wells at Sanlando; MW-4 (28 ug/l) and MW-6 (32 ug/l). These wells historically have produced similar arsenic concentrations during prior semi-annual monitoring events when the PDWS MCL for arsenic was set by rule at 50 ug/l.

Nitrate Nitrogen

Nitrate nitrogen exceeded the PDWS MCL (10 mg/l) in samples from detection well MW-2, located at the southwest margin of the landfill. As shown in Table III, nitrate was measured at 55 mg/l at MW-2. the well was resampled on March 16, 2005 with a resultant nitrate nitrogen concentration reported at 50 mg/l. This well historically produces groundwater with nitrate nitrogen concentrations above the PDWS.

Total Dissolved Solids

Total dissolved solids (TDS) exceeded the SDWS provisional MCL (500 mg/l) at four (4) of the 7 monitoring wells sampled during this event. The reported TDS levels in wells MW-2, -4, -5 and -7 are consistent with TDS concentrations measured in these wells during previous sampling events.

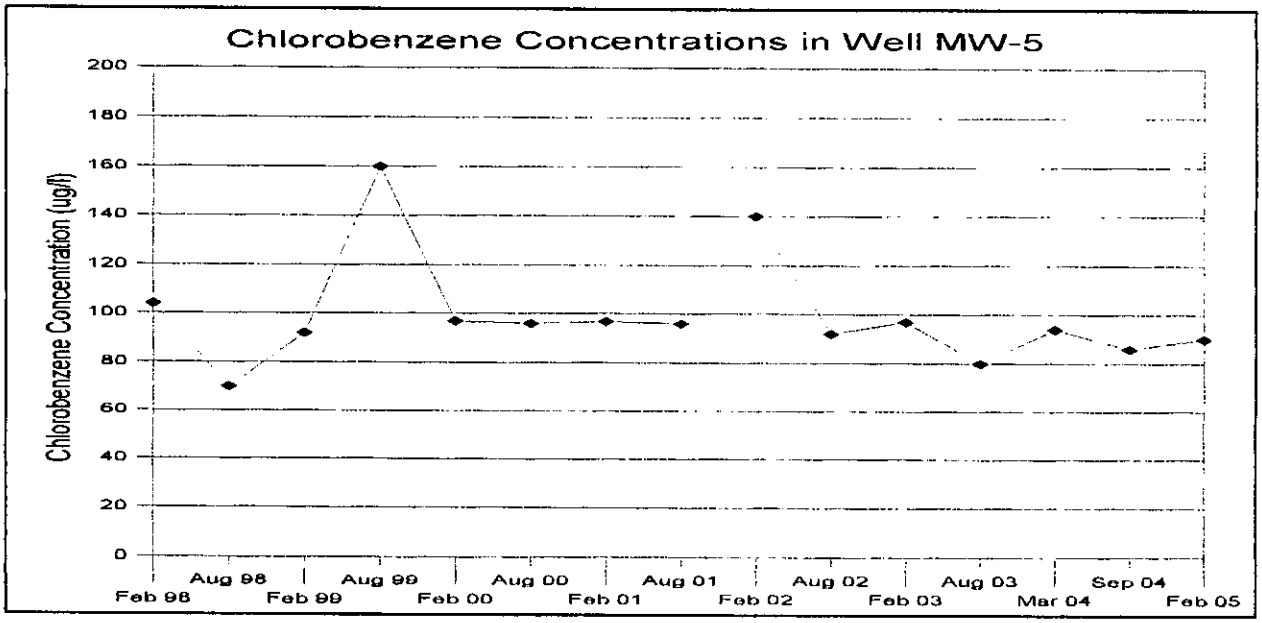
Iron

Dissolved iron concentration exceeded the SDWS MCL (300 ug/l) in three (3) of the seven (7) wells (wells MW-4, -5 and -6). Dissolved iron was well above the MCL in MW-4 at 10,000 ug/l and slightly above the MCL in wells MW-5 and MW-6 at 310 ug/l and 610 ug/l, respectively.

No other exceedance of a parameter regulatory level was reported in the laboratory analytical results for samples collected from groundwater monitoring wells and surface water stations at the Sanlando Closed Landfill.

Other Detected Parameters

Chlorobenzene was detected in samples from wells MW-4, MW-5 and MW-6 at 43 ug/l, 90 ug/l and 1.4 ug/l, respectively, below the PDWS MCL of 100 ug/l. Historical analytical results for chlorobenzene in well MW-5 are plotted over time below:



Another organic compound (1,4-dichlorobenzene) was detected in monitoring wells MW-4, MW-5 and MW-6 at concentrations well below the regulatory level for this compound. The organic compound chloroform, typically associated with chlorinated water, was detected by the laboratory in both surface water samples (SW-1 and SW-2) at trace concentrations.

A summary of organic compound detections reported by the laboratory are tabulated below.

Detected Organic Compounds
(results reported in ug/l)

Parameter	MW-4	MW-5	MW-6	SW-1	SW-2	Trip Blank	Equp. Blank	MCL
Chlorobenzene	43	90	1.4	BDL	BDL	BDL	BDL	100
Chloroform	BDL	BDL	BDL	1.5	1.7	BDL	BDL	---
1,4-Dichlorobenzene	4.4	6.5	3.1	BDL	BDL	BDL	BDL	600

Notes: 1). BDL means below method detection limit
2). --- no MCL for individual Total Trihalomethane (THM) constituents / THMs MCL is 100 ug/l.

SUMMARY

Chemical characteristics of groundwater and surface water monitored at the Sanlando Landfill have remained relatively unchanged from previous sampling events. Test results for the current event are, for the most part, consistent with water quality and analytical trends apparent from the previous sampling event in November 2004.

Nitrate nitrogen concentrations measured above the regulatory MCL in monitoring well MW-2 are consistent with past sampling results for this well. Of note are elevated nitrate levels near and exceeding the MCL in historical samples from MW-1, the facility background monitoring well.

Arsenic concentrations measured in monitoring wells MW-4 and MW-6, while consistent with historical arsenic concentrations reported for these wells, now exceed the recently amended Primary Drinking Water Standards MCL of 10 ug/l for arsenic. According to the Florida Department of Environmental Protection the amended MCL for arsenic is effective as of January 1, 2005.

Chlorobenzene and related organic compounds continue to be detected in well MW-5 at concentrations consistent with past sampling events over the last 5 years. Trace concentrations of chlorobenzene and related daughter product 1,4-dichlorobenzene were also detected in wells MW-4 and MW-6. Measured concentrations did not approach applicable regulatory levels for these constituents.

Chloroform, a trihalomethane compound generally associated with chlorinated potable water, was detected in both surface water samples from the Little Wekiva River. Concentrations of chlorofrom reported are well below the total trihalomethane MCL of 100 ug/l.

Notwithstanding the analytical constituents TDS, ammonia nitrogen, dissolved iron and, in one well (MW-2) nitrate nitrogen (chemical constituents historically exceeding regulatory levels in the groundwater monitoring wells in the Sanlando Landfill analytical data set) no other exceedances of applicable regulatory levels are noted in the Spring (February) 2005 sampling event results. Water quality in the adjacent Little Wekiva River does not appear to be adversely affected by potential groundwater discharges associated with the landfill.

* * * * *

TABLE I
FIELD PARAMETER RESULTS SUMMARY
SANLANDO (CLOSED) LANDFILL
SEMINOLE COUNTY, FLORIDA
Spring (February) 2005

Sampling Point	Temp. (C)	Dissolved Oxygen (mg/l)	pH	Specific Conductance (umhos/cm)	Turbidity (NTU)
MW-1	23.1	**4.34**	**5.62**	134	9.83
MW-2	24.2	0.11	6.79	1400	6.35
MW-3	23.0	**2.44**	6.71	224	2.38
MW-4	24.3	0.41	6.58	1590	1.44
MW-5	23.8	0.23	**6.45**	1310	2.35
MW-6	23.3	0.06	7.09	629	1.75
MW-7	24.1	0.23	6.74	1330	4.73

BOLD indicates parameter measurement exceeded: Dissolved oxygen greater than 20% saturation concentration.
ph less than secondary standards range 6.5 - 8.5 pH units.

TABLE II

SUMMARY OF GROUNDWATER LEVELS, SANLANDO (CLOSED) LANDFILL, SEMINOLE COUNTY, FLORIDA Spring (February) 2005

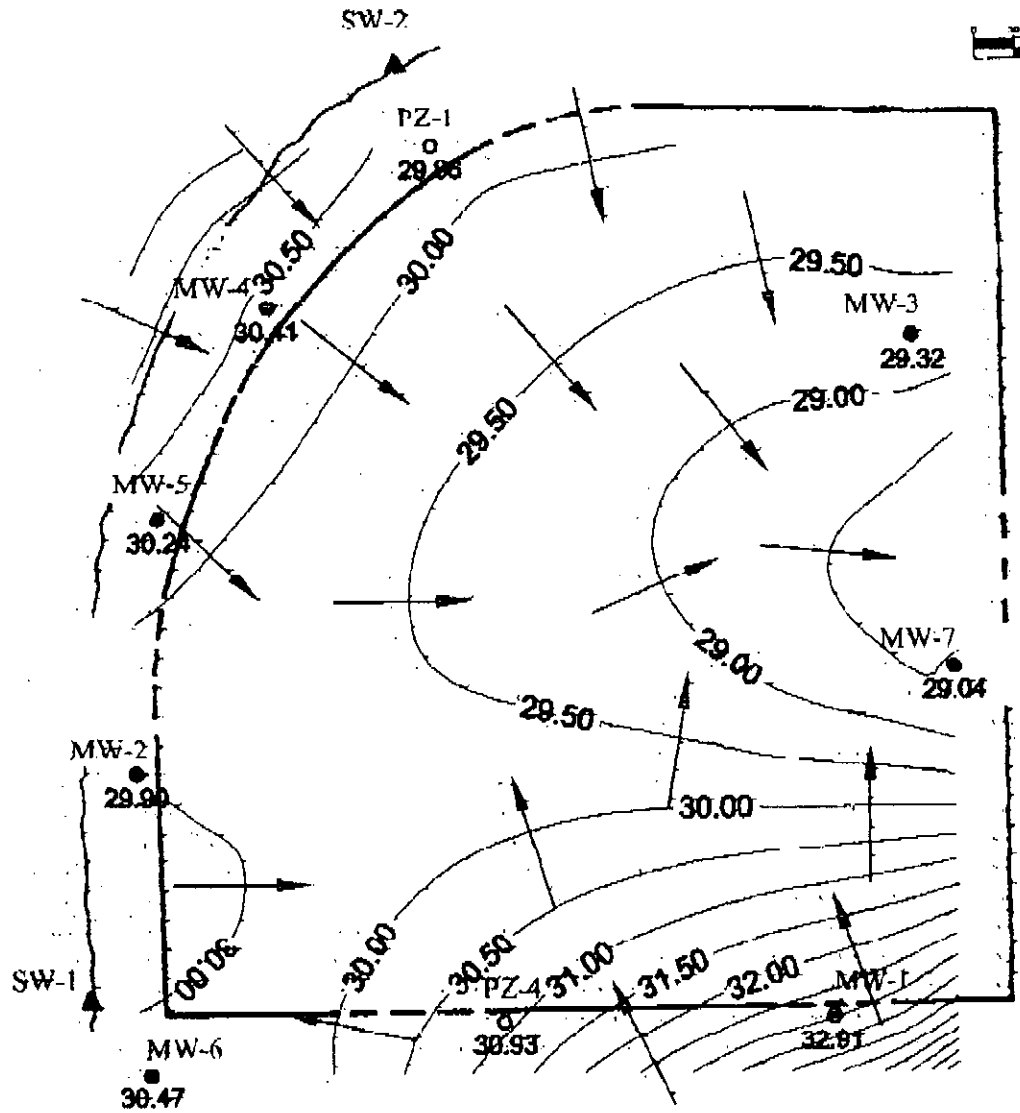
Well No.	Measuring Point Elevation (ft. + NGVD)	Depth to Water (ft. - M.P.)	Groundwater Elevation (ft. + NGVD)
PZ-1	56.48	26.62	29.86
PZ-4	68.41	37.48	30.93
MW-1	58.29	25.38	32.91
MW-2	48.51	18.61	29.90
MW-3	70.55	41.23	29.32
MW-4	55.79	25.38	30.41
MW-5	52.33	22.09	30.24
MW-6	48.18	17.71	30.47
MW-7	64.89	35.85	29.04

Notes: 1. Measuring Point is top of PVC well casings.
2. Water levels recorded on February 17, 2005

TABLE III
SUMMARY OF EXCEEDANCES
SANLANDO (CLOSED) LANDFILL
Spring (February) 2005

Monitoring Well No.	Exceeded Parameter	Concentration (Feb. 2005)	Guidance /MCL Concentration	Regulatory Standard
MW-1	pH	5.62 pH units	>6.5 pH units	Secondary
	Aluminum	470 ug/l	200 ug/l	Secondary
MW-2	TDS	940 mg/l	500 mg/l	Secondary
	Nitrate, as N	**55 mg/l**	**10 mg/l**	**Primary**
Resample (3-16-05)	**Nitrate, as N**	**50 mg/l**	**10 mg/l**	**Primary**
MW-4	**Arsenic**	**28 ug/l**	**10 ug/l**	**Primary**
	Iron	10,000 ug/l	300 ug/l	Secondary
	Ammonia, as N	43 mg/l	2.8 mg/l	Guidance
	TDS	680 mg/l	500 mg/l	Secondary
MW-5	pH	6.45 pH units	>6.5 pH units	Secondary
	Iron	310 ug/l	300 ug/l	Secondary
	Ammonia, as N	26 mg/l	2.8 mg/l	Guidance
	TDS	620 mg/l	500 mg/l	Secondary
MW-6	**Arsenic**	**32 ug/l**	**10 ug/l**	**Primary**
	Iron	610 ug/l	300 ug/l	Secondary
	Ammonia, as N	3.5 mg/l	2.8 mg/l	Guidance
MW-7	Ammonia, as N	19 mg/l	2.8 mg/l	Guidance
	TDS	690 mg/l	500 mg/l	Secondary

BOLD indicates parameter concentration exceeded Primary Drinking Water Standards MCL and/or proposed Primary Drinking Water Standards MCL for arsenic.



LEGEND

MW-6 — Monitor Well Location

30.47 — Groundwater Elevation (ft, NGVD, 3/9/05)

SW-1 — Surface Water Sampling Location

30.00 — Groundwater Contour (2/17/05)

Estimated Groundwater Flow Direction (2/17/05)

The Colinas Group, Inc. 509 N. Virginia Avenue Winter Park, Florida	Groundwater Elevation Contour Map Sanlando Closed Landfill, February 17, 2005 Seminole County, Florida	Figure 1

DRAFT

UPSALA - CLOSED LANDFILL
SEMI - ANNUAL GROUNDWATER
MONITORING REPORT

Spring (March) 2005 Sampling Event

DRAFT

Prepared for:

SEMINOLE COUNTY, FLORIDA
ENVIRONMENTAL SERVICES DEPARTMENT
SOLID WASTE DIVISION

Prepared by:

THE COLINAS GROUP, INC.
509 N. Virginia Avenue
Winter Park, Florida 32789

April 2005

UPSALA - CLOSED LANDFILL
SEMI-ANNUAL GROUNDWATER MONITORING REPORT, SEMINOLE COUNTY, FLORIDA SPRING (MARCH) 2005

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EXECUTIVE SUMMARY

Upsala Closed Landfill
Semi-Annual Water Quality Monitoring Report
Spring (March) 2005 Sampling Event
WACS #26125

INTRODUCTION

The Colinas Group, Inc. (TCG) has reviewed the enclosed groundwater monitoring well sampling analytical results for the Spring (March) 2005 sampling event for the Upsala Closed Landfill. Water quality results were consistent with past sampling events.

No significant changes in groundwater quality at the Upsala Landfill monitoring wells were observed in the data reviewed for this reporting period. Overall, water levels in monitoring wells have declined by about 1 to 2 feet since the previous sampling event in November of 2004.

SAMPLING EVENT

The routine semi-annual sampling event at the Upsala Landfill occurred on March 14 through 16, 2005. Sampling was performed by qualified TCG personnel in accordance with the Florida Department of Environmental Protection (FDEP) Standard Operating Procedures (SOP) for Field Activities. Water samples from the groundwater monitoring wells were tested for the required field parameters and allowed to stabilize during purging, prior to sample collection. The results of field testing were recorded as part of the Field Reports (Appendix 3) and are listed in Table I. All water samples were preserved and stored as required prior to shipment to the analytical laboratory.

Laboratory analytical services were provided by US Biosystems, Inc., Boca Raton, Florida in accordance with the laboratory's FDEP-approved ComQAP #980126 and FDHRS Certification #E86240. The original laboratory analytical reports prepared by US Biosystems are formatted to conform with FDEP Form 62-522.900(2) and are presented in Appendix 2 to this report.

The water quality monitoring network at the Upsala Landfill is comprised of fifteen (15) groundwater monitoring wells. The wells each tap one of three aquifers beneath the landfill site, namely; the shallow water table aquifer, an intermediate aquifer, and; the deeper artesian aquifer. Letter designations S, I and D of each well name denote which aquifer is monitored at each well.

Groundwater depths at the monitoring wells were measured prior to sampling on March 14, 2005. These measurements were used to develop water level and potentiometric surface contour maps for the three aquifers monitored. Groundwater contour maps are presented in Appendix 1 to this report. Groundwater depths and elevations recorded during the sampling event are presented on the laboratory analytical reports in Appendix 2. Water level measurements recorded on March 14, 2005 are presented in Table II.

RESULTS

Field-Tested Parameters

Results of field testing completed at groundwater monitoring wells for the Spring (March) 2005 sampling event are summarized in Table I. Field tests were completed by TCG sampling personnel in accordance with the FDEP SOP for Field Activities.

Fluid Temperature

Temperature of each water sample was measured at the pump discharge tubing during sample collection for field parameter testing. Temperature measurements of groundwater from the monitoring wells were similar and consistent among the different aquifers monitored. Groundwater from the deeper wells was generally slightly warmer than water from shallower wells. No unusual water temperatures were recorded during the sampling event.

Dissolved Oxygen

Dissolved oxygen (DO) was below the FDEP sampling guidance level of 20% saturation in all of the monitoring wells sampled during this event.

Specific Conductance

Specific conductance of groundwater samples collected during this sampling event are consistent with historical values and trends measured at facility monitoring wells.

Typically, groundwater specific conductance is expected to increase from the uppermost water table aquifer to deeper artesian aquifers commonly comprising deposits of carbonate clays and rocks. Historical and recent specific conductance measurements at Upsala do not necessarily follow this generalized trend.

Sample Turbidity

The FDEP recommends attainment of turbidity values less than 20 NTUs in groundwater samples obtained from monitoring wells. As shown in Table I, groundwater samples collected during this sampling event had measured turbidity levels less than 20 NTUs.

Regulatory Exceedances

A summary of groundwater sample laboratory analytical results that exceeded the regulatory level for the particular parameter in the Spring (March) 2005 sample set is presented in Table III. As shown, several parameters were reported at concentrations that exceed applicable regulatory levels.

pH

Field testing results indicate pH of groundwater in one (1) of the nine (9) shallow water table aquifer monitoring wells (MW-5S) sampled during this event was below the FDEP pH range of 6.5 to 8.5. Two (2) of the three (3) intermediate aquifer wells (MW-2I and MW-8I) reported pH less than 6.5., as did one (MW-8D) of the three (3) deep monitoring wells. Slightly acidic to acidic pH of groundwater in aquifers overlying the deeper carbonate sediments is considered normal for central Florida and, at the Upsala Landfill, is likely the result of the luxurious and prolific vegetation at the site and normally high water table levels.

The highest pH (alkaline) was recorded at deep well MW-9D at 9.38 pH units, above the upper regulatory range of 8.5. Slightly buffered pH (alkaline) groundwater is considered normal for groundwater in carbonate limestone aquifers

Ammonia Nitrogen

Ammonia nitrogen (ammonia as N) was measured in seven (7) of the fifteen (15) wells at concentrations above the FDEP Chapter 62-777,F.A.C. Groundwater/Surface Water Cleanup Target Level (guidance level) of 2.8 mg/l. Concentrations exceeding the guidance level ranged from 3.4 to 11 mg/l. Six (6) of the wells with ammonia nitrogen above the guidance level monitor the shallow water table aquifer; the remaining well (MW-8D) monitors a deeper groundwater unit.

Iron as Fe

Dissolved iron was found above the Secondary MCL of 300 ug/l in fourteen (14) of the fifteen (15) monitoring wells sampled during this event, including upgradient shallow water table aquifer and deep wells. Elevated iron concentrations above 300 ug/l are considered typical for groundwater in shallow aquifers throughout central Florida. The high iron concentrations noted during this sampling event, consistent with past sampling results, are likely partly the result of the extensive and prolific vegetation growth within and near the Upsala Landfill property.

Regulatory Exceedances

A summary of groundwater sample laboratory analytical results that exceeded the regulatory level for the particular parameter in the Spring (March) 2005 sample set is presented in Table III. As shown, several parameters were reported at concentrations that exceed applicable regulatory levels.

pH

Field testing results indicate pH of groundwater in one (1) of the nine (9) shallow water table aquifer monitoring wells (MW-5S) sampled during this event was below the FDEP pH range of 6.5 to 8.5. Two (2) of the three (3) intermediate aquifer wells (MW-2I and MW-8I) reported pH less than 6.5., as did one (MW-8D) of the three (3) deep monitoring wells. Slightly acidic to acidic pH of groundwater in aquifers overlying the deeper carbonate sediments is considered normal for central Florida and, at the Upsala Landfill, is likely the result of the luxurious and prolific vegetation at the site and normally high water table levels.

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Iron as Fe

Dissolved iron was found above the Secondary MCL of 300 ug/l in fourteen (14) of the fifteen (15) monitoring wells sampled during this event, including upgradient shallow water table aquifer and deep wells. Elevated iron concentrations above 300 ug/l are considered typical for groundwater in shallow aquifers throughout central Florida. The high iron concentrations noted during this sampling event, consistent with past sampling results, are likely partly the result of the extensive and prolific vegetation growth within and near the Upsala Landfill property.

Total Dissolved Solids

Total dissolved solids (TDS) exceeded the Florida Secondary Drinking Water Standard MCL (provisional) of 500 mg/l at five (5) of the fifteen (15) wells sampled, ranging from 510 mg/l to 1,600 mg/l in samples from shallow aquifer monitoring wells

No other exceedance of a parameter regulatory level was reported in the laboratory analytical results for groundwater samples collected during this sampling event.

Non-Exceeding VOC Detections

A non-exceeding concentration of benzene was detected in groundwater samples from monitoring well MW-8D at 1.0 ug/l benzene. The Primary Drinking Water Standards MCL for benzene is 1.0 ug/l. Benzene was detected in this well at 1.0 ug/l during the previous sampling event in November 2004. The well was subsequently resampled in December 2004 and benzene was reported by the laboratory below the method detection limit (1.0 ug/l).

SUMMARY

Chemical characteristics of groundwater monitored at the Upsala Landfill have remained relatively unchanged from the previous (November 2004) sampling and reporting event. Test results for the current event are consistent with the previous results for the wells sampled.

Benzene was detected at the laboratory method reporting limit and Primary Drinking Water Standards MCL of 1.0 ug/l in the sample collected from deep monitoring well MW-8D.

Laboratory analytical results for this monitoring period indicate that the closed Upsala Landfill is not having an adverse impact on groundwater quality.

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TABLE I
FIELD PARAMETER RESULTS SUMMARY,
UPSALA LANDFILL, SEMINOLE COUNTY, FLORIDA
SPRING (MARCH) 2005

Sampling Point	Temp. (C)	Dissolved Oxygen (mg/l)	pH	Specific Conductance (umhos/cm)	Turbidity (NTU)
MW-1S	21.6	0.01	6.54	960	10.10
MW-2S	21.7	0.07	6.67	910	4.95
MW-2I	24.2	0.33	**5.59**	175	13.60
MW-2D	23.4	0.14	7.06	531	1.74
MW-3S	18.4	0.31	6.77	1840	2.39
MW-4S	20.4	0.01	6.77	1980	3.49
MW-5S	21.5	0.38	**4.81**	494	4.54
MW-6S	22.9	0.03	6.83	1080	2.66
MW-7S	22.3	0.01	6.53	384	3.52
MW-8S	21.6	1.33	6.72	632	9.97
MW-8I	22.2	0.02	**6.32**	188	14.9
MW-8D	22.2	0.08	**6.29**	386	10.16
MW-9S	19.0	0.06	6.97	649	5.09
MW-9I	22.9	0.82	7.32	372	5.31
MW-9D	22.8	0.14	**9.38**	417	9.67

Notes: **Bold** lettering indicates: 1). exceedance of secondary standard MCL range (6.5 - 8.5 pH units) for pH

TABLE II

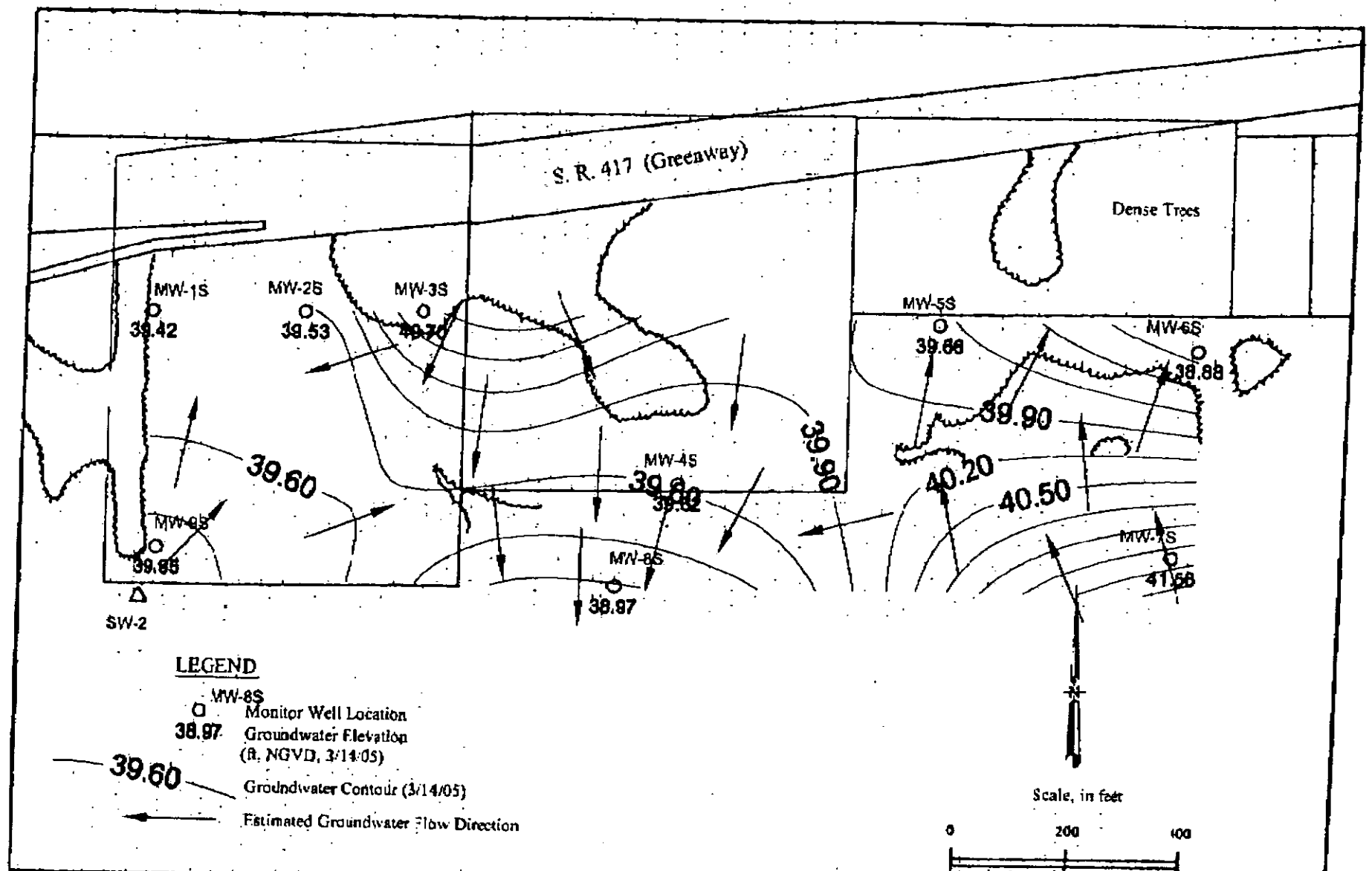
SUMMARY OF GROUNDWATER LEVELS
UPSALA LANDFILL - CLOSED
SPRING (MARCH) 2005

Well No.	Total Well Depth (Feet bls)	Measuring Point Elevation (ft. + NGVD)	Depth to Water (ft. - M.P.)	Groundwater Elevation (ft. + NGVD)
MW-1S	17.95	47.82	8.40	39.42
MW-2S	17.00	46.99	7.46	39.53
MW-2I	68.00	47.96	9.48	38.48
MW-2D	102.9	48.45	15.09	33.36
MW-3S	15.25	47.96	8.08	39.88
MW-4S	17.7	49.51	9.89	39.62
MW-5S	25.45	53.03	13.37	39.66
MW-6S	22.5	52.98	14.10	38.88
MW-7S	24.5	54.41	12.85	41.56
MW-8S	17.45	48.60	9.63	38.97
MW-8I	73.00	49.33	15.26	34.07
MW-8D	103.00	49.79	16.60	33.19
MW-9S	18.40	48.12	8.17	39.95
MW-9I	71.00	48.01	13.22	34.79
MW-9D	103.00	47.78	14.10	33.68

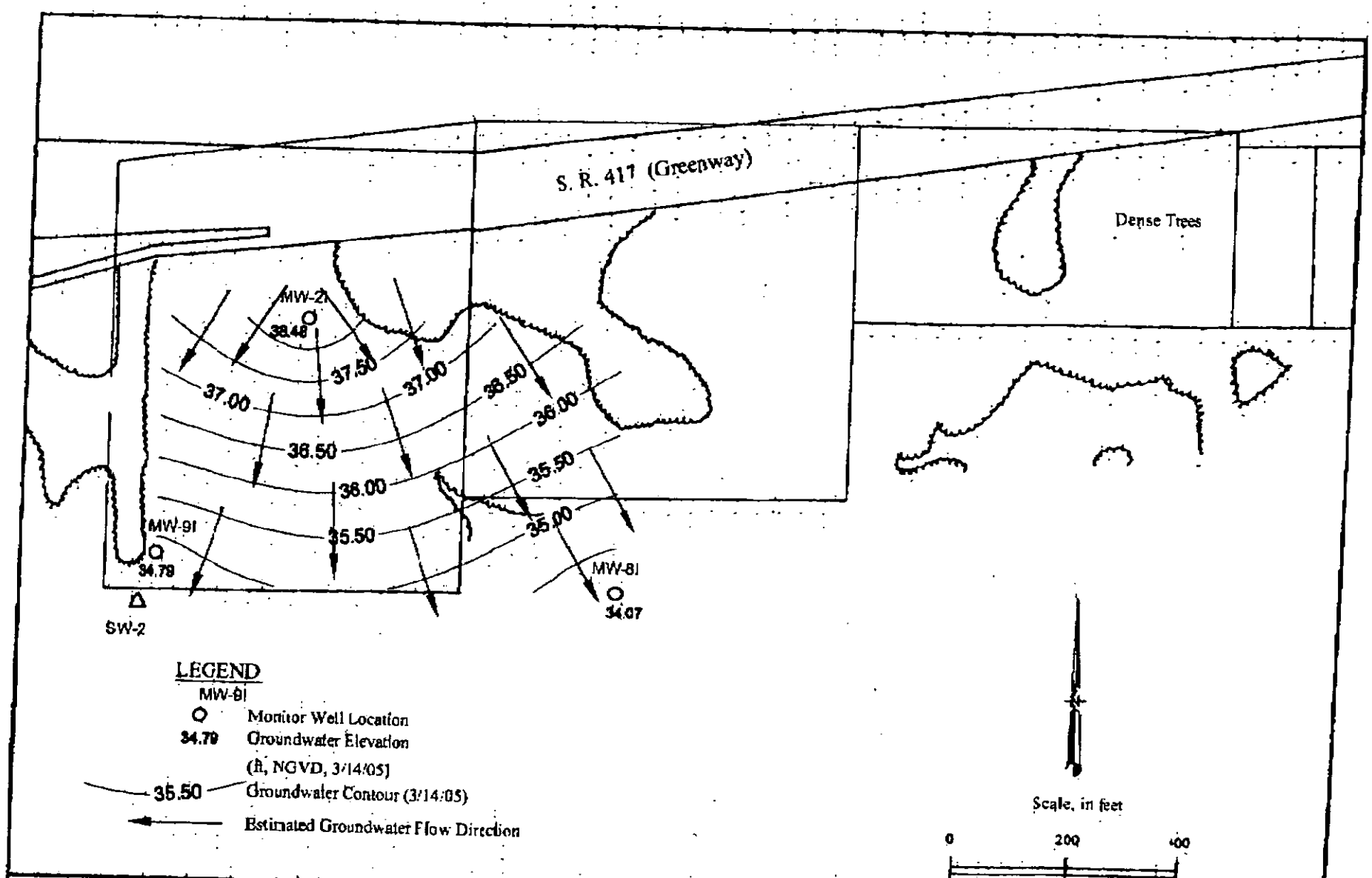
Notes: 1. Measuring Point is top of PVC well casings.
2. Water levels recorded on March 14, 2005.

TABLE III
SUMMARY OF EXCEEDANCES
UPSALA LANDFILL - CLOSED
SPRING (MARCH) 2005

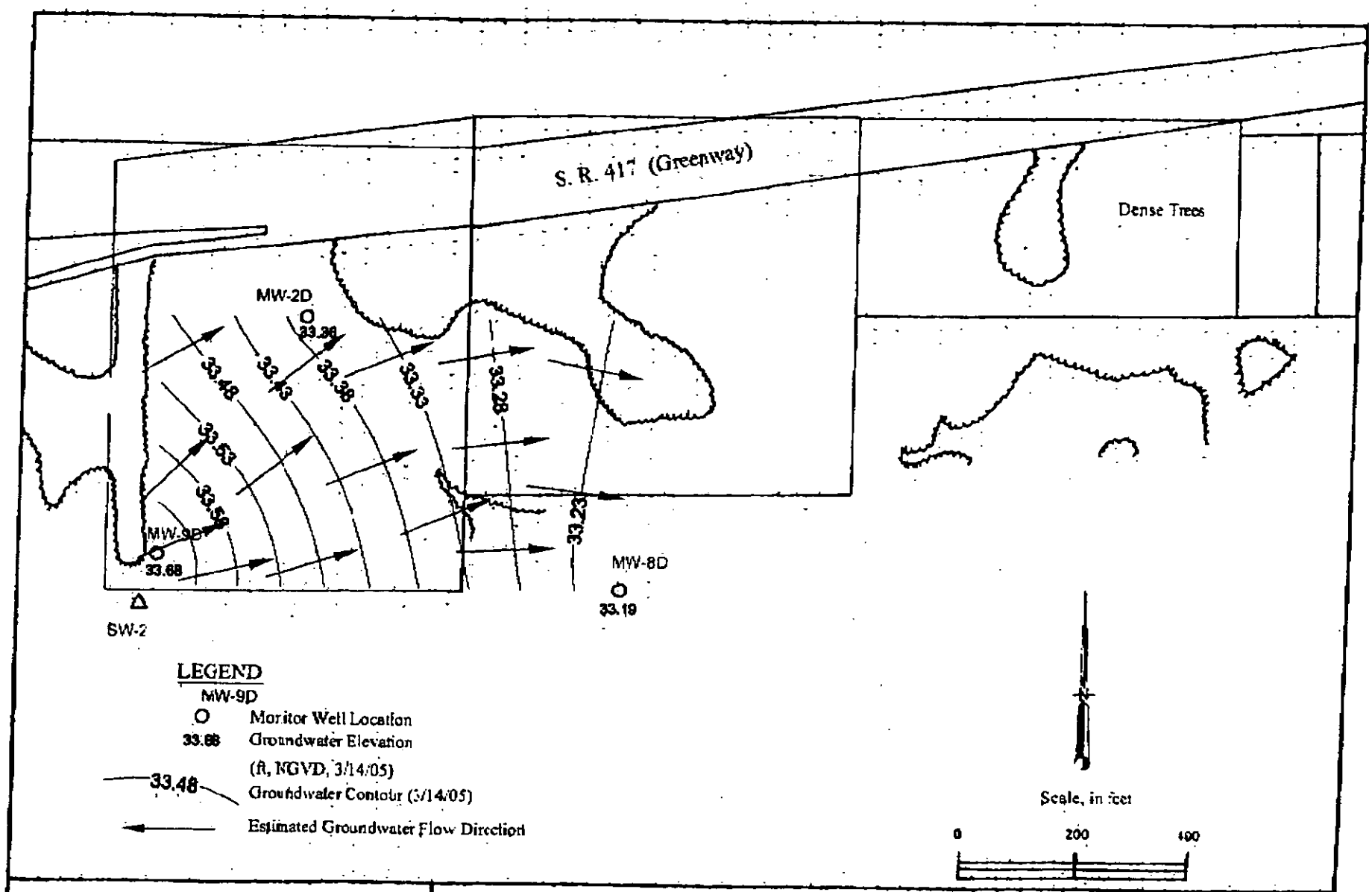
Monitoring Well No.	Exceeded Parameter	Field / Laboratory Result	Guidance /MCL Concentration	Regulatory Standard
MW-1S	Ammonia, as N Iron TDS	3.9 mg/l 17,000 ug/l 590 mg/l	2.8 mg/l 300 ug/l 500 mg/l	Guidance Secondary Secondary
MW-2S	Iron Ammonia, as N	62,000 ug/l 4.8 mg/l	300 ug/l 2.8 mg/l	Secondary Guidance
MW-2I	pH Iron	5.59 pH units 8,700 ug/l	<6.5 pH units 300 ug/l	Secondary Secondary
MW-2D	Iron	4,500 ug/l	300 ug/l	Secondary
MW-3S	Ammonia, as N Iron TDS	3.5 mg/l 5,000 ug/l 1,400 mg/l	2.8 mg/l 300 ug/l 500 mg/l	Guidance Secondary Secondary
MW-4S	TDS	1,600 mg/l	500 mg/l	Secondary
MW-5S	pH Iron TDS	4.81 pH units 5,500 ug/l 510 mg/l	<6.5 pH units 300 ug/l 500 mg/l	Secondary Secondary Secondary
MW-6S	Ammonia, as N Iron TDS	3.48mg/l 19,000 ug/l 570 mg/l	2.8 mg/l 300 ug/l 500 mg/l	Guidance Secondary Secondary
MW-7S	Ammonia, as N Iron	3.4 mg/l 16,000 ug/l	2.8 mg/l 300 ug/l	Guidance Secondary
MW-8S	Ammonia, as N Iron	11 mg/l 43,000 ug/l	2.8 mg/l 300 ug/l	Guidance Secondary
MW-8I	pH Iron	6.32 pH units 9,800 ug/l	6.5 pH units 300 ug/l	Secondary Secondary
MW-8D	pH Ammonia, as N Iron	6.29 pH units 7.8 mg/l 41,000 ug/l	6.5 pH units 2.8 mg/l 300 ug/l	Secondary Guidance Secondary
MW-9S	Iron	20,000 ug/l	300 ug/l	Secondary
MW-9I	Iron	2,300 ug/l	300 ug/l	Secondary
MW-9D	pH Iron	9.38 pH units 1,200 ug/l	>8.5 pH units 300 ug/l	Secondary Secondary



The Collinas Group, Inc. 509 N. Virginia Avenue Winter Park, Florida	Upsala Landfill - Water Table Aquifer Groundwater Contour Map, March 14, 2005	Figure 1



The Collinas Group, Inc. 509 N. Virginia Avenue Winter Park, Florida	Upsala Landfill - Intermediate Aquifer Groundwater Contour Map, March 14, 2005	Figure 2



The Collins Group, Inc. 509 N. Virginia Avenue Winter Park, Florida	Upsala Landfill - Deep Aquifer Groundwater Contour Map, March 14, 2005	Figure 3

EXHIBIT I

UPSALA CLOSED LANDFILL

WACS FACILITY ID: 26125

MONITORING PLAN IMPLEMENTATION SCHEDULE

GENERAL

1. The responsible party must initiate implementation of this Monitoring Plan within sixty (60) days from the date of issuance.

2. The field testing, sample collection and preservation and laboratory testing, including quality control procedures, shall be in accordance with **Chapter 62-160 Florida Administrative Code (F.A.C.).** Approved methods as published by the Department or as published in Standard Methods, ASTM, or EPA Methods shall be used.

3. The organization collecting samples at this site must use the Field and Laboratory Standard Operating Procedures (DEP-SOP-001/01 and DEP SOP-002/01) in Chapter 62-160, F.A.C. Sampling personnel must have a copy of the SOP for purging and sampling in the field when sampling and must be knowledgeable of its contents, procedures, and forms. The laboratory designated to conduct the chemical analyses must be certified by the Florida Department of Health Environmental Laboratory Certification Program (DoH ELCP). This Certification must be for the test method and analyte(s) that are reported.

4. If, at any time, analyses show that ground water standards or minimum criteria are exceeded in the detection wells or at the edge of the Zone of Discharge, the Permittee shall resample the wells within thirty (30) days after the sampling data are received, to confirm the data. Should the permittee choose not to resample, the Department will consider the water quality analysis as representative of current ground water conditions at the facility. If the data are confirmed, or if the permittee chooses not to resample, the permittee shall notify the Department in writing within 14 days of this finding. Upon notification by the Department, the permittee shall initiate evaluation monitoring in accordance with Rule 62-701.510(7) F.A.C.

5. The Department must be notified in writing at least fourteen (14) days prior to the installation and/or sampling of any monitoring well(s).

GROUND WATER QUALITY MONITORING

6. The fifteen (15) ground water monitoring wells designated for water quality testing are listed on Attachment A and are shown on Attachment B.

NOTE: Unless otherwise approved by the Department, wells with high turbidities must be remediated or reinstalled to reduce the turbidity value to less than 20 NTU's

prior to sample collection. Should any ground water sample exhibit dissolved oxygen concentrations greater than 20% of oxygen saturation at the field measured temperature, the sampled well must be repurged then resampled as soon as an acceptable dissolved oxygen value has been attained unless it can be demonstrated that insitu ground water contains higher levels of dissolved oxygen. All water quality analyses will be performed on unfiltered samples unless approved by the Department.

7. Samples from the fifteen (15) ground water monitoring wells shall be collected semi-annually and analyzed as follows: temperature (field), dissolved oxygen (field), pH (field), specific conductance (field), turbidity (field), total ammonia as N, chlorides, nitrate, total dissolved solids, iron, mercury, sodium, and the EPA 40 CFR, Part 258, Appendix I parameters. **All analyses must use detection limits at or below state standards and/or minimum criteria for ground water quality** unless dilution of the sample is necessary due to high contaminant concentrations or the Method Detection Limit using the most sensitive and currently available technology is higher than a specific criterion, in which case the practical quantitation limit must be used.

8. Ground water levels in all wells, whether sampled or not, and all piezometers must be measured to the nearest 0.01 foot and reported semiannually unless required more frequently by permit condition. All water level measurements must be made within a one day period. These measurements must be referenced to the National Geodetic Vertical Datum of 1929 (NGVD).

MONITORING WELL REQUIREMENTS

9. If a monitoring well becomes damaged or inoperable, the Permittee shall notify the Department in writing within seven (7) days. The written report shall describe what problem has occurred and the remedial measures that have been taken to prevent a recurrence. The Department can require the replacement of inoperable monitoring wells or piezometers.

10. New or replacement monitoring well design or placement must be approved by the Department. Proposed well construction details based on site specific borings must be submitted with all supporting data (grain size distribution analyses, in-situ hydraulic conductivity testing, depth to water, etc.) for Department approval prior to well installation. Use of hollow stem auger equipment is recommended. Other drilling methods must be approved by the Department prior to well installation.

11. All wells shall be clearly and permanently labeled and the well site maintained so that the well is visible at all times. Protective barriers must be installed at all wells which may be subject to damage by heavy equipment or traffic.

12. An abandonment plan for abandoning any well which is unsuitable for ground water monitoring or for any piezometer must be approved by the Department prior to abandonment.